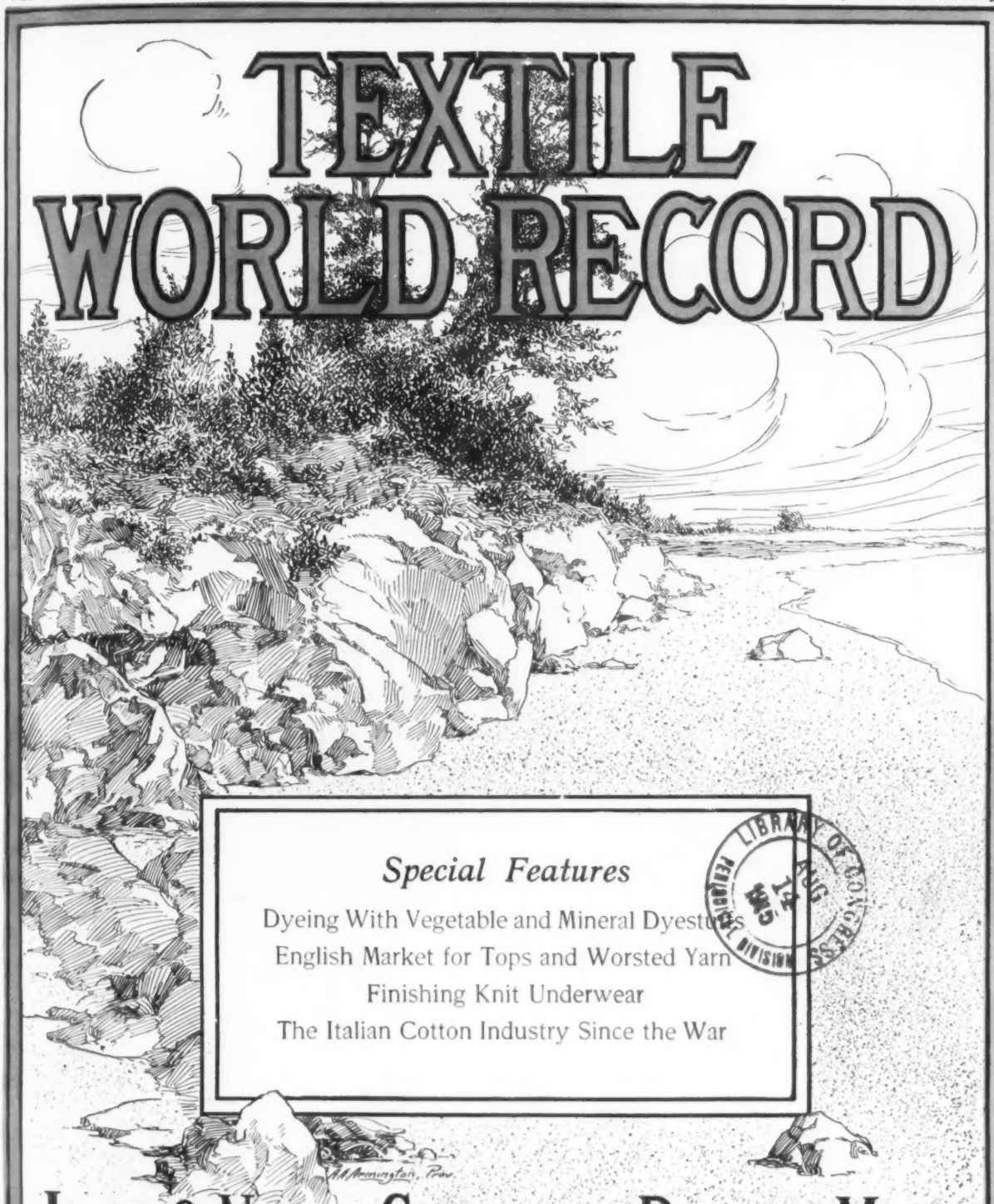
Number 5
Volume XLIX

AUGUST, 1915

$2.00 per year
$3.00 with Directory

TEXTILE WORLD RECORD



Special Features

Dyeing With Vegetable and Mineral Dyestuffs
English Market for Tops and Worsted Yarn
Finishing Knit Underwear
The Italian Cotton Industry Since the War

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LORD & NAGLE COMPANY ~ BOSTON · MASS.

Table of Contents Page 49 Buyers Index Page 147 Index to Advertisements Page 157

The TEXTILE-FINISHING MACHINERY CO.

Howard Building, Providence, R. I.

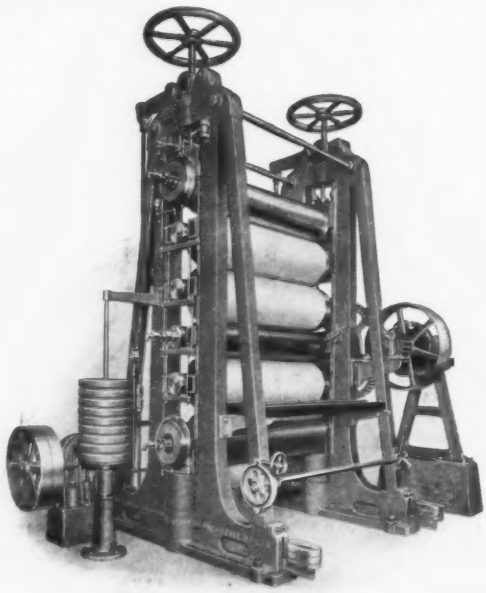
BUILDERS OF

Singeing, Bleaching, Mercerizing, Dyeing, Drying, Printing and Finishing Machinery

FOR

TEXTILE FABRICS AND WARPS

Plans and Estimates for Complete Plants



6 Roll Hydraulic Calender

ROLLER, CHASING, HYDRAULIC, EMBOSSING AND FRICTION CALENDERS AND MANGLES

Cotton, Paper, Husk, Iron, Steel, Rubber and Brass Rolls, and our

SPECIAL COMBINATION COTTON-HUSK ROLLS

Bleaching Kiers with Patent Circulators

FOR

RAW STOCK, YARN, WOVEN AND KNIT GOODS

Bleaching, Drying, Dyeing

and

Finishing Machinery

For Textile Fabrics

Bleach House
Machinery of All Kinds

Drying Machines
(Copper and Tinned Steel Cylinders)

Singeing Machines
(Oil and Gas)

Color Kettles
with Stirrers

Open Soaping
Machines

Calenders
For all Purposes

Mercerizing Ranges
(Piece and Warp)

High Speed Tentering Machines
for elastic finish with Automatic Clamps

Return Tentering Machines
for Woolen Goods

Hydraulic Presses

Dye House
Machinery of All Kinds

We are also sole Licensees and Makers in the United States for Daniel Foxwell & Sons, Manchester, England, of the

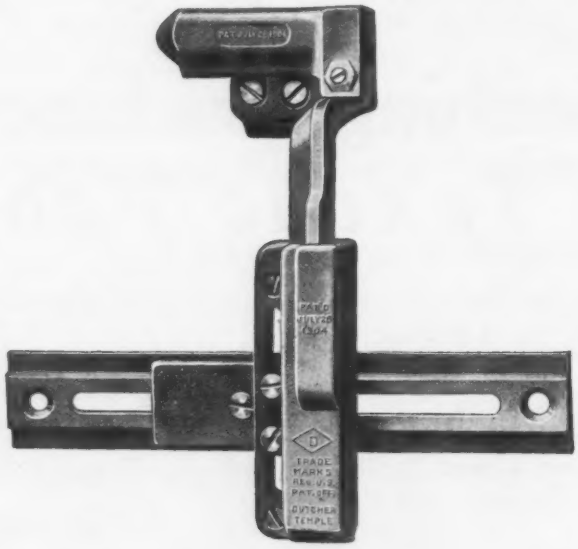
KAY & FOXWELL'S Patent Pneumatic Guider and Feeder

Simpson Patent Cloth Winder, No Stopping to Change Rolls, — Increased Production

H. W. Butterworth & Sons Co.

Providence Office
1212 TURKS HEAD BUILDING

PHILADELPHIA, PA.



DUTCHER TEMPLES

Trade Mark Reg. U. S. Pat. Off.

DRAPER COMPANY

SOLE MANUFACTURERS

HOPEDALE MASS.

Northrop Loom Repairs

TRADE MARK REGISTERED

We again call attention to the importance of purchasing Northrop loom repairs of the makers of the looms. We have spent thousands of dollars in fitting up moulding machines to insure the most uniform castings possible. It is false economy to buy such repairs of job foundries or other outside sources of supply.

Customers who purchase of us avoid the troubles incident to misfits, hard castings and the resultant bad cloth in the weave room.

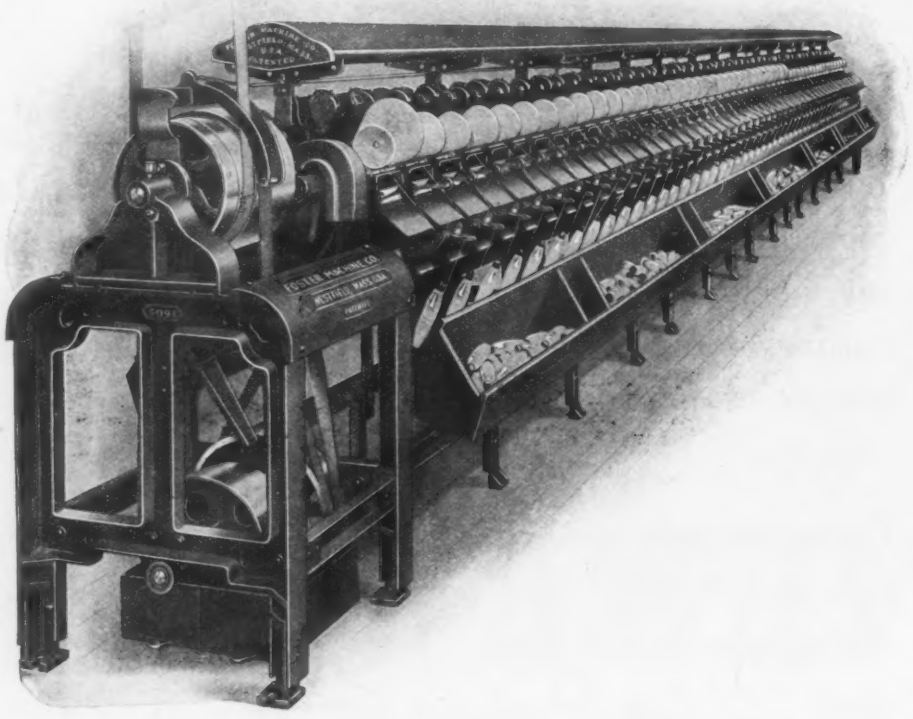
We carry several hundred tons of finished loom repairs in stock for the convenience of our customers.

DRAPER COMPANY

HOPEDALE MASS.

J. D. CLOUDMAN Southern Agent
188 South Forsyth Street Atlanta Georgia

The Foster Model 30



The Model 30 Cone Winder has every good principle of former Models incorporated in it. In addition, the new Model is more flexible of adjustment and may be set to produce finished cones of much greater taper than former Models, although paper cones of the same or lesser pitch are used.

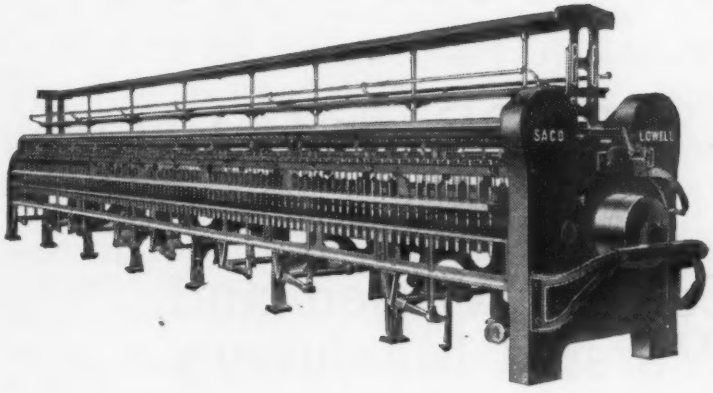
Foster Machine Company

Westfield, Massachusetts

JOHN HILL, Southern Agent, 1014 Healey Bldg., Atlanta, Ga.

Saco-Lowell Shops

TEXTILE MACHINERY



Shops—
Lowell, Mass.
Biddeford, Maine
Newton Upper Falls, Mass.

Executive Offices—
77 Franklin Street
Boston, Mass.

Southern Agent, ROGERS W. DAVIS,
Charlotte, N. C.

COMPLETE COTTON MILL EQUIPMENT
Including:
Pickers
Cards
Drawing
Evener Drawing
Roving
Spinning
Twisters
Slashers
Spoolers
Reels
Winders
Warpers
Looms

WASTE RECLAIMING MACHINERY

WORSTED MACHINERY
Including:
Revolving Creels,
Gill Boxes
Drawing Frames,
Reducing and Roving Frames,
Cap Ring and Flyer Spinning and Twisting Frames
Jack Spoolers

LEIGH & BUTLER

IMPORTING ENGINEERS

232 Summer Street, Boston, Mass, U. S. A.

Long Distance Telephone—
Main 2693

Cable Address—
"Leigh," Boston

TEXTILE MACHINERY

Sole Agents in the United States and Canada for

PLATT BROS. & CO., Ltd.

OF OLDHAM, ENGLAND

By far the Largest Makers in the World of

Cotton, Woolen and Worsted Machinery

Also Sole Agents in U. S. and Canada for

MATHER & PLATT, Ltd.

Equipment of Complete Works for

BLEACHING, CALICO PRINTING, DYEING AND FINISHING

Patent Mechanical FILTERS for Town Supplies and all Industrial Purposes

Wool Washing and Drying Machines, Napping Machines, Sykes' Card Clothing for Cotton, Critchley's Card Clothing for Woolen and Worsted, Wilson Bros'. Bobbins, etc., Harding's Pins, Fallers and Circles, Dronsfield's Grinding Machinery and Emery Fillet; Double Loop Bands, Scroll Banding etc.; Condenser and Gill Box Aprons, etc.

AN ANNOUNCEMENT *by the* Carrier Engineering Corporation

CARRIER ENGINEERING CORPORATION is the title of a new company formed to exploit and install the apparatus formerly sold under the name of the Carrier Air Conditioning Co.

The change is in name only, one which is wider in scope. Policy, Personnel and Address will remain the same.

The chief business of the CARRIER ENGINEERING CORPORATION will be to equip industrial and other buildings with the Carrier System for Humidifying, Heating, Cooling, Ventilating and Drying.

The world success of the Carrier System has placed it in the front rank of air conditioners for buildings where atmospheric control is either necessary or desirable. The Carrier System is also installed in old buildings.

Textile Manufacturing has furnished one of the Carrier System's most responsive fields. Carrier Equipped textile plants are producing better yarns and fabrics at a greater speed of production and at considerable lower cost than could otherwise be possible.

A Carrier Engineer is always ready to call and submit plans and estimates without obligation.

"It Humidifies, Ventilates, Heats and Cools."

Carrier Engineering Corporation

39 Cortlandt Street, New York, N. Y.

W. H. CARRIER, M. E.
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E. T. MURPHY, M. E.
SECRETARY

J. I. LYLE, M. E.
TREASURER AND GENERAL MANAGER

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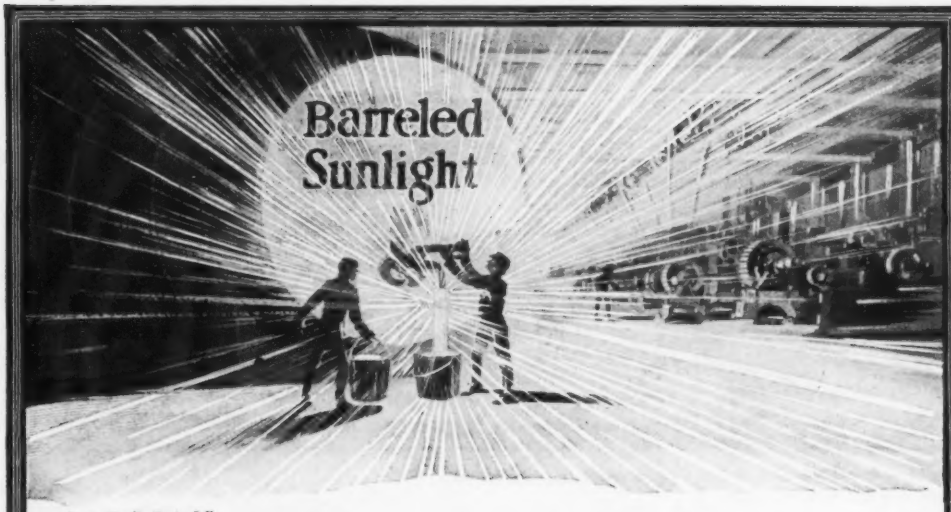
Executive Office, 77 Franklin Street, Boston, Mass.

Southern Office, Greenville, S. C., Edwin Howard

Works at Taunton, Mass.



Reg. U. S. Pat. Off.

Why it is costly to use imitations of Rice's

There are a number of "mill-whites" on the market, all of them open imitations of the original, Rice's Gloss Mill-White.

These imitations are all ***varnish*** gloss paints, whereas Rice's is an ***oil*** paint, although it does not yellow like ordinary oil paints. It is ***not*** a cold water paint but ***can be applied over old cold water paint by the "Rice Method."***

Varnish gloss paints dry too brittle, and are liable to crack and peel. They may look as white as Rice's when first put on, but those who use them soon discover that they turn distinctly yellow.

Now, what is the use of painting ceilings and walls with a gloss paint which very soon turns yellow and which is liable to crack and peel? It would be more economical to use whitewash, for then the cost of repainting would be less.

Guaranteed to Remain White Longest

If you use Rice's, you are protected. ***We guarantee*** that if Rice's does not remain white longer than any other gloss paint, applied at the same time, and under the same conditions, ***we will give, free, enough Rice's to repaint the job with one coat.*** We also guarantee that, properly applied, Rice's will not flake nor scale. You cannot lose under this guarantee.

Write for Booklet "The Yellow Peril" and Sample Board

Sold direct from factory

Sold direct from our factory in barrels containing sufficient paint to cover 20,000 square feet—one coat.

RICE'S GLOSS MILL-WHITE

U. S. GUTTA PERCHA PAINT CO.
20 Dudley Street, Providence, R. I.

On concrete surfaces

On inside concrete, Rice's Granolith makes the best possible primer for a second coat of Rice's Gloss Mill-White—giving a tile-like enamel finish at no more expense than lead and oil paint.

Rice's Granolith

Parks' Piping Parables

You know the old adage—familiarity breeds contempt. I want to take issue with it. I don't think familiarity breeds contempt. It breeds respect—and better yet, it breeds precision.

Did you ever notice a good base ball player at work? A subtle something—the scientists might label it the subconcious mind—tells him where to stick out his fist for the ball. Practice has made his action automatic.

Does a good billiard player or a good golf player stop to analyze his play? If he does, he hasn't got into the good player class.

Watch a good stenographer. Doesn't familiarity breed precision?

Does familiarity with the piping business breed contempt for it? Not so — if a man has a business he's ashamed of, the chances are he ought to be.

The first essential to success in play or in business is to know the game or the business and to know it so thoroughly that decision is swift and sure.

A college professor with a book of logarithms might be able to figure out just the spot that a ball batted into centerfield would drop—but he couldn't take Speaker's place as a fielder.

I am not belittling science—but I ask you if even in the piping business, a familiarity with it might not breed a precision that would be worth while to the customer.

Familiarity breeds a sense of sureness:—not cock sureness, but a feeling so hard to describe—of being on the right track.

And yet, notice that the good golfer or the good baseball player after he has become an expert, spends hours in practice.

So I come to my point: We spend all our time at the piping business and allied problems. We think, eat, dream in terms of piping lore. We think we know our business and yet—like the good player—we are practising all the time to breed a precision here that is worth money to you.

As I write, I can think of work that we are doing—going on in Canada, Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, Virginia and North Carolina.

I say this not as one so boastful. But to impress, if I can on you who yet remain outside the fold of our ledger that there are those who have a faith in the Parks way.

The Parks way is a long up-hill process in evolution in piping. Started in 1872 the Parks way has been one of constant attempt to do things a little better than they were done before, even to the extent of occasionally denouncing our own productions. It's a peculiar thing—this evolution business. It circles around such simple things.

Darwin evolved a great theory out of the classification of sea life. Newton sprung the law of gravitation in the world by seeing an apple fall to the ground.

Burbank dreamed dreams in vegetables in the town of Lunenburg, next door to us in Fitchburg—and saw some of them come true in California.

The Burbank potato is nature—led by the hand—to so simple a thing as a larger potato and more to the hill.

Every great invention came from the application of some simple law; a law that has always existed, awaiting the mind that would set it to work.

Your thought of modern piping is that it is complicated; ours is to make it as simple as possible. Your thought of modern piping is that it is expensive; ours is to make it as cheap as possible—figuring years of service as well as price. Your thought of the steam fitter of today is that he is a bum; ours is to surround ourselves with men as well as workmen. Your thought of a piping bill is that it is a mystery, ours is to make each transaction subject to proof if necessary. Your thought of modern piping is that it is a guess; ours is to make it subject to exact law.

These are simple things. But it has taken over forty years to supply the answers to these varients, and the absolutely perfect so far away.

I come to you to ask you for your piping business—when you need it—on the basis of some of these things that have been mentioned. We want the chance to demonstrate, for your good word, passed along to your friends is better advertising that all the Parables that ever have or ever will be written.

PARKO.

The G. M. Parks Company, Fitchburg, Massachusetts

Getting the Best of Nature

In the month of August it is easy to appreciate the variations in humidity as it effects the individual in your mill or office.

Too much humidity interferes with the efficiency of your employees and too little is just as bad. Both effect your profits.

Lack of the right degree of humidity in your mill effects your raw materials as well as your finished products. Insufficient humidity means decreased profits to you.

In so far as your mill is concerned the Turbo Humidifier can overcome Nature's deficiencies and give you the right degree of humidity for whatever "peculiar conditions" prevail in your mill.

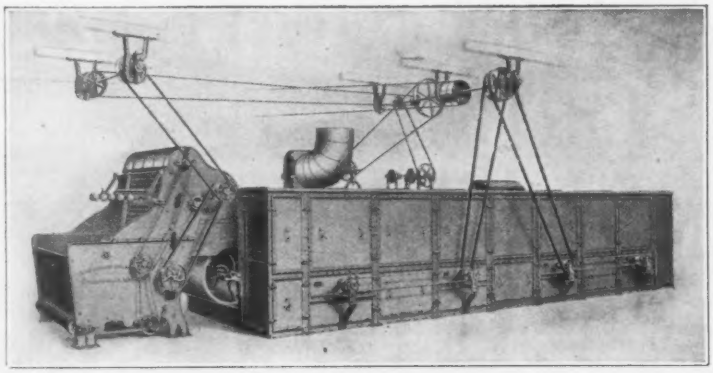
It doesn't matter whether your mill is old or new; low or high-posted; the Turbo with its freedom from drain pipes, casings, cloths, mantles, moving parts, etc. will meet your requirements—and we guarantee results satisfactory to you.

Shall we send you a Turbo Engineer or a Turbo catalogue or both? You can ask for either without obligating yourself in any way.

The G. M. Parks Company

Fitchburg, Mass.

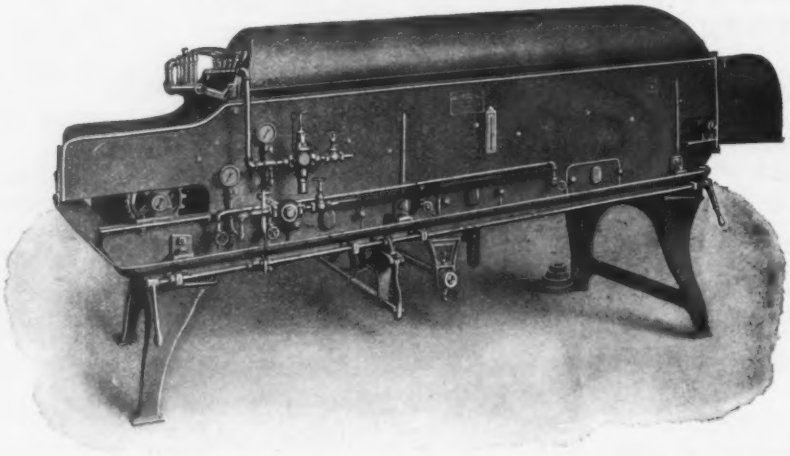
Southern Office, 200 Commercial Bank Building, Charlotte, N. C. **J. S. COTHRAN, Mgr.**



Sargent Automatic Drying Machines

For Drying Wool, Cotton, Hair, Silk, Flax

Containing exclusive features which permit greatest economy in operation. Ball Bearing Fans. Improved principle air circulation. Specially designed Feeders Automatic Apron Adjusting Device



The Yarn Conditioning Machine

The most effective and systematic method of setting twist
Eliminates Kinky Yarn difficulties

Wool Washers, Wool Dusters and Openers
Burr Pickers, Automatic Feeds for Cotton and Wool
Complete Carbonizing Plants

C. G. Sargent's Sons Corp., Graniteville, Mass.

Be Your Own "Efficiency Expert"!

The Textile Manufacturer does not need to pay any "efficiency expert" to learn the "efficiency methods" for one expensive operation in textile manufacturing — the movement of goods from upper to lower floors.

You can acquire authoritative and exhaustive information of these efficiency methods by yourself and without cost. The methods saving hours of time and labor and hundreds of dollars every year for hundreds of manufacturers are all clearly described and illustrated in this new beok, "Otis Gravity Spiral Conveyors." The coupon below brings you a free copy of this Book.

Suppose you could save all the expense and most of the time of the daily moving of supplies, unfinished and finished goods from upper to lower floors and levels. Isn't that the kind of efficiency you want in your plant? Wouldn't it be about the biggest saving you ever have made or ever could make? To know whether you can make this saving you have only to read this Book with its comprehensive but compact information on Gravity Spiral Conveyors and their employment in almost every kind of plant.

Use The Coupon Today

OTIS ELEVATOR COMPANY

Eleventh Ave. and Twenty-sixth St.

NEW YORK

Offices in All Principal Cities of the World

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OTIS
Elevator Co.
New York

Please send free copy of your new book to

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Position.....

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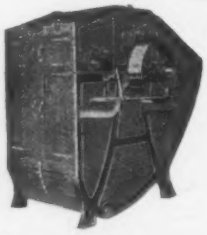


The Hunter

NO. 10
FULLING
MILL

DRIVING SIDE

GEAR DRIVE

CLOTH WASHERS

PEICE DYE
KETTLES

SOAPING
MACHINES

BELT DRIVE

ROPE DRIVE

JAMES HUNTER MACHINE CO.

NORTH ADAMS, MASS., U. S. A.

A Consistent Winner

The Westinghouse Steel Type CS Motor

The Evidence:—

The following list showing some recent installations and contracts of Type CS motors ranging from 300 to 4000 horsepower:

Eagle & Phenix Mills	Georgia	J. & J. Dobson	Pennsylvania
Grantville Hosiery Mills	Georgia	Botany Worsted Mills	New Jersey
Pelzer Corporation	South Carolina	Princeton Worsted Mills	New Jersey
Brown Mfg. Co.	North Carolina	Grosvenor Dale Mfg. Co.	Connecticut
Flint Mfg. Co.	North Carolina	Livingston Worsted Mills	Rhode Island
King Cotton Mills	North Carolina	River Spinning Co.	Rhode Island
National Yarn Mills	North Carolina	Ludlow Mfg. Associates	Massachusetts
Ozark Cotton Mills	North Carolina	Naumkeag Steam Cot. Co.	Massachusetts
Revolution Cotton Mills	North Carolina	Waltham Bleachery	Massachusetts
Rosemary Mfg. Co.	North Carolina	West Boylston Mfg. Co.	Massachusetts
Scotland Cotton Mills	North Carolina	Mishawaka Woolen Co.	Indiana
American Viscose Co.	Pennsylvania		

Westinghouse Electric & Mfg. Co.

EAST PITTSBURGH, PA.

BOSTON
Boston Safe Deposit and Trust Building

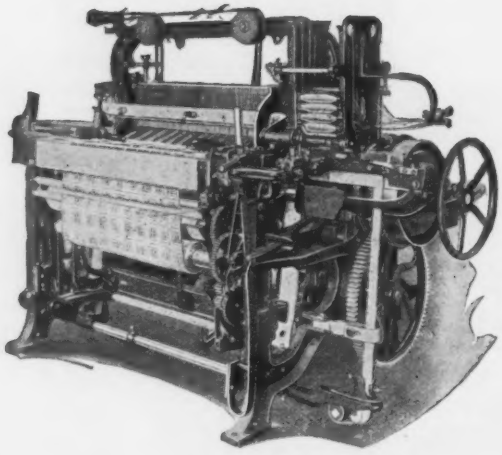
NEW YORK
165 Broadway

PHILADELPHIA
North American Building

CHARLOTTE
American Building

ATLANTA: Candler Building

Crompton & Knowles Loom Works



Automatic Gingham Looms

One of our latest productions for weaving goods of two or more colors in the filling. Like every loom we build, it has the advantage of a successful mill test.

WORCESTER, MASS.

Providence, R. I. **Philadelphia, Pa.**

Southern representative, ALEXANDER & GARSED, Charlotte, N. C.

ECONOMY AND SAFETY

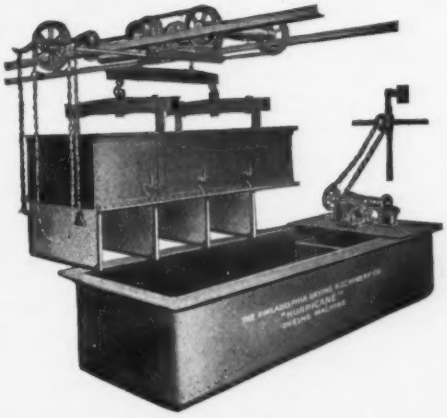
YOU GET BOTH WITH

"Hurricane" Machinery

FOR

HOSIERY
SKEIN
YARN
SLUBBING
etc.

The best and mosteconomical Dyeing Machines

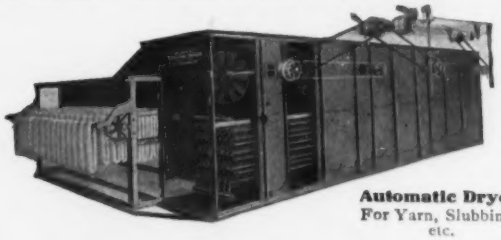


BETTER DYEING
at
LESS EXPENSE

—

Give us an opportunity to prove our claims

"Hurricane" Circulating Dyeing Machines are built in various sizes and types



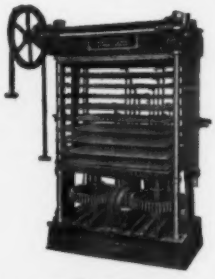
Automatic Dryer
For Yarn, Slubbing, etc.

Complete Equipments for

Dyeing
Scouring
Bleaching
Carbonizing

FIRE-PROOF DRYERS

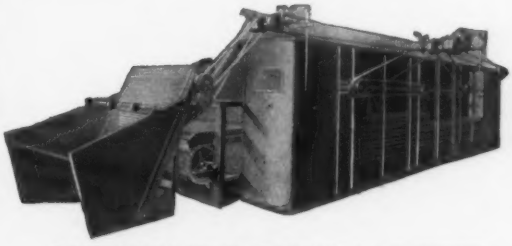
STEEL CONSTRUCTION
INSULATED WITH ASBESTOS



Power-Screw and Hydraulic
PRESSES

Fans

Motor and Belt Driven



AUTOMATIC STOCK DRYER
(With Sectional-Continuous Conveyor)
For Cotton, Wool, Hair, Rags, etc.

THE PHILADELPHIA DRYING MACHINERY CO.

Main Office and Works: 6721 Germantown Ave., Phila., Pa. **Boston Office: 53 State Street**

Paper Speeder Bobbins

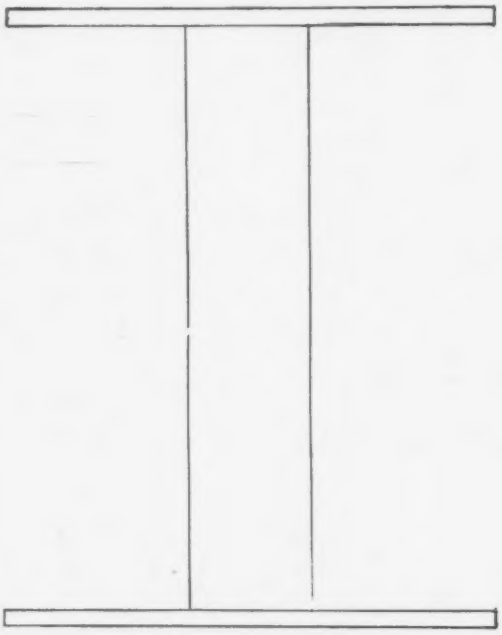
Will Neither Split, Chip, Swell, Shrink Nor Warp

These bobbins are far superior to speeders and slubbers made of wood. As they won't split or chip there are no rings or shields needed and that means reduced cost.

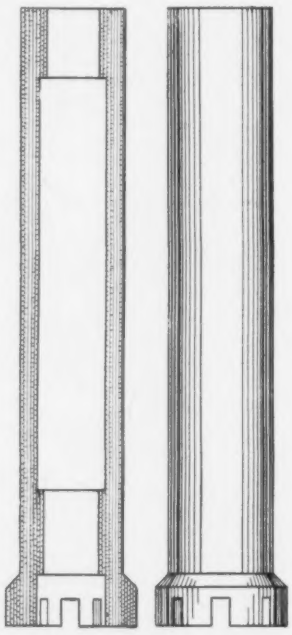
Not being effected by steam or other moisture they will not shrink, swell or warp and so are accurate in size at all times, and—

They Do Not Absorb Oil Which Insures Clean Yarn Free From Spots

Indorsed by 60 textile mills. Samples free on request.



Paper Spools In All Sizes



Paper Speeder Bobbin
Patents Pending

American Paper Bobbin Co., Inc.

670 Eddy Street - - Providence, R. I.
N. Y. Office, 13th St. and Boulevard, Long Island City, N. Y.

Paper Bobbins, Tubes, Spools, Horns and Megaphones

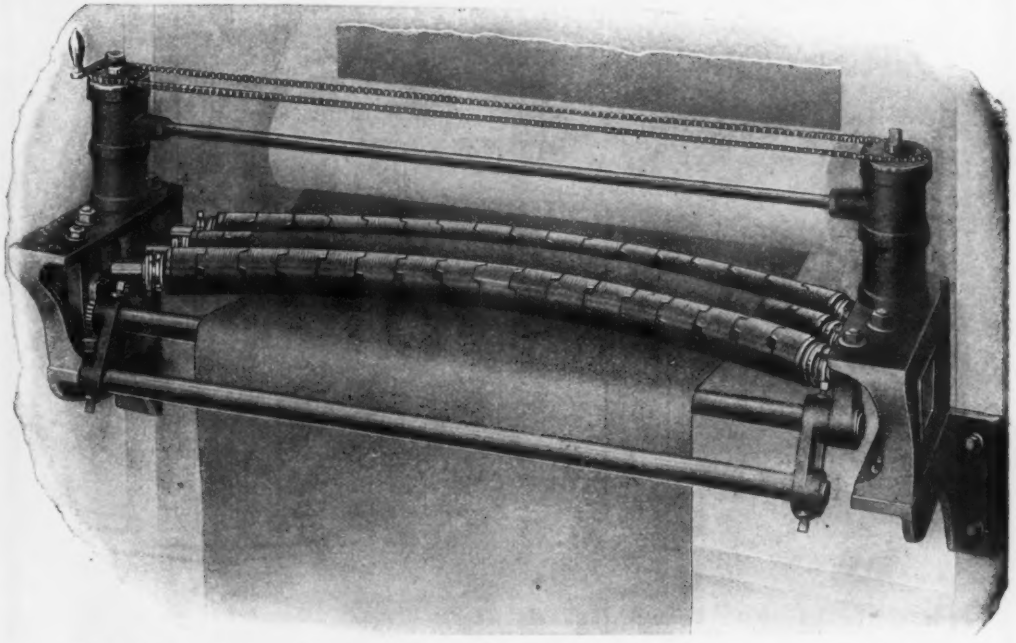
THOMAS LEYLAND & COMPANY

F. T. Walsh, Manager

60 India Street, Boston, Mass. WORKS AT READVILLE, MASS.

Sole Manufacturers of THE WILLIAM MYCOCK

Improved Regulating Cloth Expander



Expander attached to Calender showing Regulating Motion and Adjustable Tension Bars

This Expander and its improved features are fully protected by basic United States patents, and by others still pending, under which the builders will maintain their patent rights against any who may violate such rights by building, selling or using machines of this character.

We solicit correspondence from those having new ideas for Calico Printing, Dyeing, or Bleaching Machinery, either patented, or capable of being patented, and which they wish developed or manufactured.

Scutchers, Sewing Machines, Open Bleaching Machines, Blanket Washers for Calico Printers, Guides, Etc.

Starch

Corn Products

DO YOU KNOW THAT Corn Starch in its modified forms has replaced potato, sago, and cassave starches in sizing and finishing?

Every mill that has changed over gives the same reason—"CORN STARCH PRODUCES THE RESULTS FOR LESS MONEY."

Have *you* discovered the advantage of using Modified Corn Starches, dextrine, corn syrup and corn sugar?

We are prepared to show you how to use these products to your advantage and improve your processes.

For full information address

Corn Products Refining Company

17 Battery Place, New York, N. Y.

Starch

DUXBAK

On Important Drives

There's just one make of belting on every important drive in the plant of The Standard Aluminum Co., Two Rivers, Wis.

It is DUXBAK.

And all the minor drives will soon be DUXBAK because a DUXBAK drive is successful under the most exacting service.

The photograph above shows the main driving belt of 3 ply thickness, 30 inches wide and 155 feet long. It is operating under an exceedingly variable load but is returning absolutely satisfactory service. At times it is transmitting 500 hp. from the engine shaft to the aluminum rolling mills. The drive to the right is also a DUXBAK. Those in charge highly recommend DUXBAK Belting.

Ask for literature.

Chas. A. Schieren Company

ESTABLISHED 1868

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Belt Manufacturers

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The Texas Chas. A. Schieren Co., Inc.
106 So. Market St., DALLAS, Texas

OAK LEATHER TANNERIES - Bristol, Tenn.

WATSON, LAIDLAW & CO. LD.

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PATENT WATER-DRIVEN

HYDRO-EXTRACTOR

Underdriven Baskets

24 in. Diameter to 48 in.

Suspended Baskets

24 in. Diameter to 84 in.

Retain the benefit of self-balancing with entire absence of belts and gearing. No working parts requiring lubrication except spindle, which only requires a little grease once or twice a year. Can be placed anywhere regardless of power or moisture.

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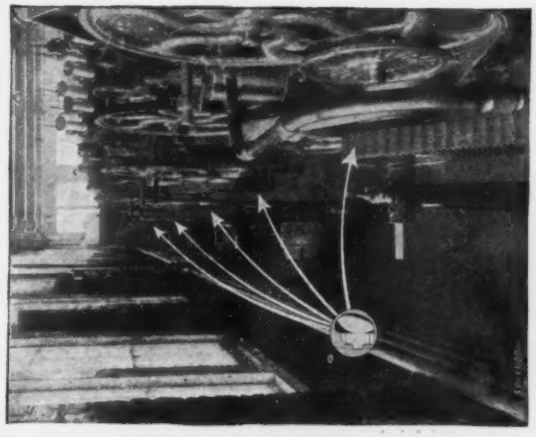

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POSITIVE speed ratio between driving and driven shafts insures maximum production; 98½ to 99% sustained efficiency prevents gradual dropping off in production; quietness leaves employees' minds free for devotion to work; convenience of application minimizes installation difficulties; reliability and long life with low up-keep cost are the other ecomical features.

The illustration shows 7½ HP MORSE Silent Chain Drives to Spinning Frames in a Woolen Mill

Application

IN a total of over 1,200,000 horsepower of MORSE Silent Chains now in service, you will find almost every conceivable kind of application. In almost every industry listed in the alphabet, from Agriculture and Automobile in the A's to Textile and Woodworking at the other end, MORSE Silent Chains are transmitting power, quietly, efficiently, economically and otherwise satisfactorily to all kinds of regular and special machines and to shafting.

The transmission of power to machine or shaft is an identical problem in all industries except as conditions may slightly modify the importance of the various features.

No matter what your business or your requirements, you can feel perfectly safe in placing your problem in our hands. We can probably show where we solved the same questions for others years ago and know exactly what to give you now.

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ATLANTA, Earl F. Scott, M. E.
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Underdriven Baskets

24 in. Diameter to 48 in.

Suspended Baskets

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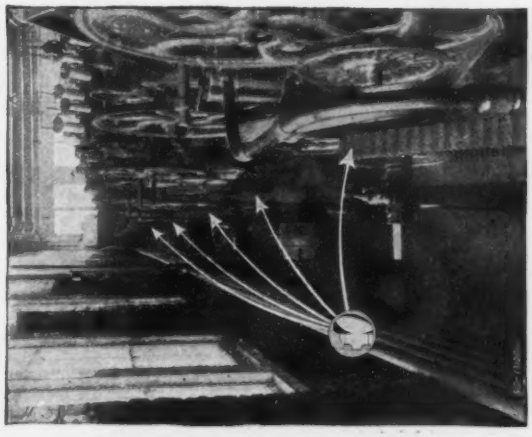

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Lane Canvas Mill Baskets Boxes or Trucks

Found in the Largest and Most Modern Mills

BECAUSE

FIG. 27

Lane Canvas Truck.
Made as shown, or with canvas partition. Mounted on improved **Thread Guard** Wheels, as above, or on swivel casters. Leather bound rim. Heavy duck.

Durability
Smoothness
Lightness
Economy

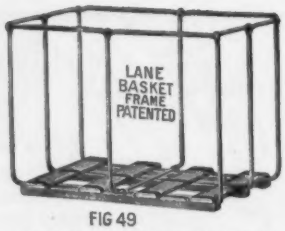

FIG 49

Lane Basket Frame of Tough Spring Steel.
Renewable Hard Maple Shoes.
Also furnished with steel shoes, where dragging is not severe.
Number and diameter of frames varies with size of baskets.

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A Style for Every Use

W. T. Lane & Brother

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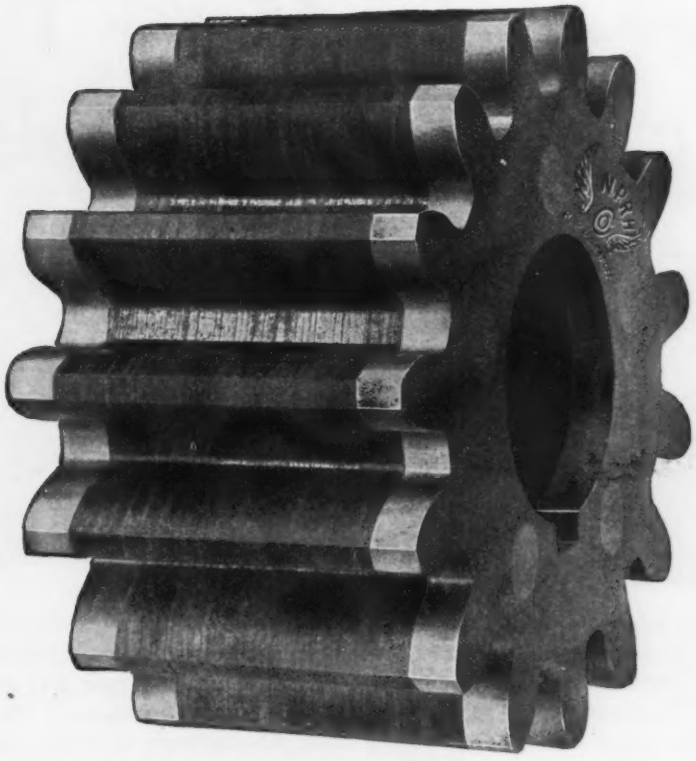

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are permanently quieter than new metal pinions—always smooth in action where wear makes a metal pinion the source of serious vibration.

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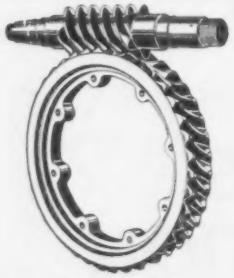
108

Pierce-Arrow Motor Trucks *in the* Textile Trade

For the rapid and economical transportation of both raw materials and finished product, Pierce-Arrow 5-ton and 2-ton worm gear motor trucks have already a well-established reputation in the textile trade.

It is worth bearing in mind that the worm gear drive, particularly advantageous in textile service due to its extreme reliability and absolute cleanliness, was first introduced in this country by the Pierce-Arrow Motor Car Company. This construction is now very generally imitated, but no other American worm gear motor truck embodies the valuable results of years of experience under actual working conditions in many different kinds of service. If the advantages of worm gear drive appeal to you, it will surely be wise to purchase a truck which has long since passed the experimental stage.

If you will advise us exactly what your service requirements are, we can probably put you in touch with some textile operator who has found the Pierce-Arrow motor truck a satisfactory solution of a transportation problem similar to your own. The names of representative Pierce-Arrow truck owners in the textile trade follow:



The Worm-Gear

All Pierce-Arrow Trucks are equipped with the worm-gear drive, which is a positive guarantee of effective service under the most difficult conditions.

The Goodall Worsted Co., Sanford, Me.; Silk Finishing Company of America, New York City; Somerville Mfg. Company, Somerville, Conn.; Winslow Bros. & Smith, Norwood, Mass.; Rhode Island Processing Co., Coventry, R. I.; The Wanskuck Co., Providence, R. I.; Mansfield Bleachery, Providence, R. I.; High Rock Knitting Co., Troy, N. Y.; American Woolen Co., Boston, Mass.; Boston Woven Hose & Rubber Co., Boston, Mass.; Hoosac Cotton Mills, Boston, Mass.

The Pierce-Arrow Motor Car Co.

BUFFALO, NEW YORK

82" Main Drive Belt
82" 3-ply belt. Length, 104 feet. Driving Pulley, 15 feet.
Receiving Pulley, 16 feet. Distance between pulley centers, 28 feet.
85 R. P.M. 4000 F. M. P. 1150 Horse Power. Installation, March, 1915.
Fisk Rubber Co., Chicopee Falls, Mass.

One Inch or Eighty-two Inch

Loom Belt or Main Drive Belt. For any service and every service, G & K Belts give absolute satisfaction.

Because like the Fisk 82", all G & K belts from the smallest to the largest are quality products throughout. They are carefully constructed from leather of our own tannage, tanned slowly, uniformly, and expressly for belting purposes. They possess the essential qualities of pliability, firmness with minimum stretch, great tensile strength, and durability. Lastly, they are absolutely guaranteed as to quality and workmanship.

There is a G & K belt for every drive—its use means maximum production and low cost of operation.

Our Engineering Department is thoroughly equipped to give expert assistance and advice upon any transmission problem, and to investigate and design any drive upon request. Why not let us serve you?

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Oak Leather Tanners and Belt Makers Worcester, Mass., U.S.A.

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Cramer "High Duty" Air Conditioner

Cramer Automatic Regulator

FACTS

In several large mills equipped with humidifiers of other makes, we have entirely reorganized their system, installing our "High Duty" equipment with automatic humidity and temperature control and the average improvement during the succeeding twelve months test is:

A—Seconds reduced over 50%.
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What Would Similar Results Be Worth To You?

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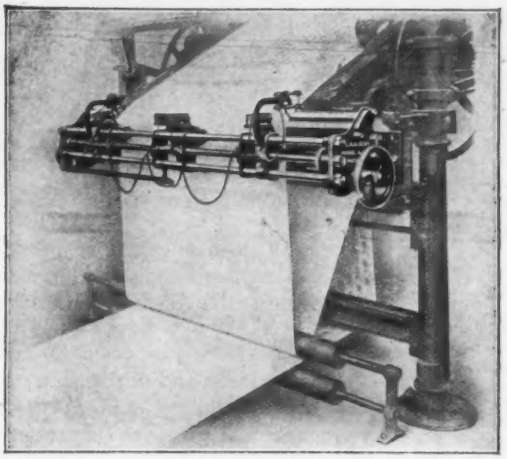
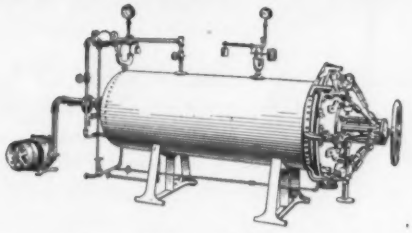
CLOTH FEEDERS

Over 1800 Running



For TENTERS, straight and swinging, CALENDERS, Etc.

100% to 200% Investment



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These two machines are built in the United States and we can make prompt deliveries

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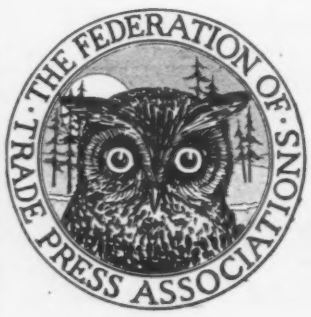

For additional information write the Editor of this Journal, or

Bartley J. Doyle, Chairman Committee on Arrangements

512 Race Street, Philadelphia

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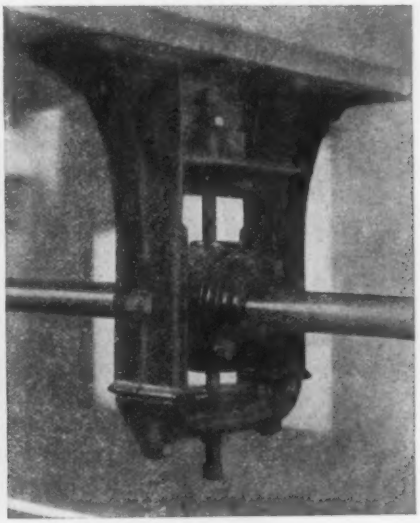

12 Knitters per horsepower as compared to six where plain babbitt bearing hangers are used

Plain Babbitt Hangers Scrapped—the Reason—More Power—Less Money

More power was required at the plant of Tonner & Moyer, Landsdale, Pa. The old equipment of plain babbitt hangers consumed too much power. They realized that they must either enlarge their power plant or not use a number of knitters.

SKF SELF ALIGNING BALL BEARINGS

and Hangers were suggested—result—power waste eliminated—knitters and ribbers were operated at a remarkably low cost.

Complete details covering their problems—how they overcame them will be mailed on request. Also Special Catalog No. 14-M on Textile Machinery. Send for them today.

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Rotary Dyeing and Washing Machine

CYLINDER CONSTRUCTED WITH 2 OR 3 COMPARTMENTS

This new type of machine has proven a great success. The cylinder is built of all wood or non-corrosive metal, according to kind of work intended for.

All types of Dyeing and Finishing Machines for Hosiery.

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"Builders of The Best"

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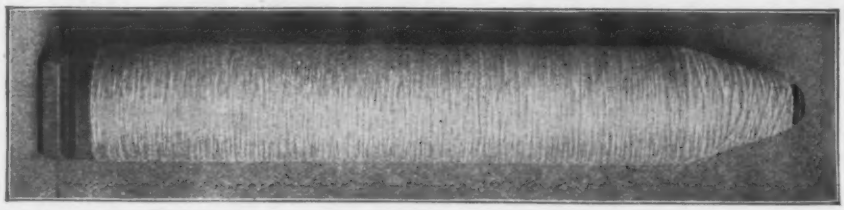
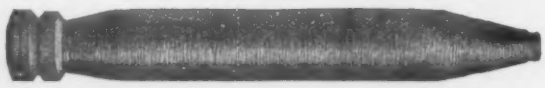


SHUTTLE bobbins from seven-eighths to two inches in diameter and any length up to twelve inches. Suitable for all kinds of Duck, Upholsteries, Tapestries, Asbestos, Ratana, or any kind of fancy yarns for automatic or other looms.



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Manufacturers of Textile Machinery—Winders Especially

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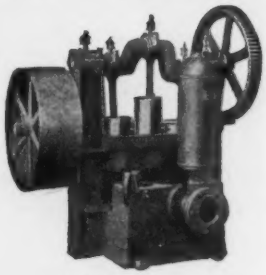
For Circulating Liquids—For Humidifier Service For Feeding Boilers—For Private Water Supply



Goulds Fig. 957
Triplex Pump

and for all other pumping services for Textile Mills, Bleacheries and Dyehouses there is a Goulds Pump that will give you economical, efficient and reliable operation.

We will send you on request, a complete set of bulletins describing and illustrating our entire line of Triplex, Centrifugal, Air and Vacuum and Deep Well Pumps.

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Goulds Fig. 3030
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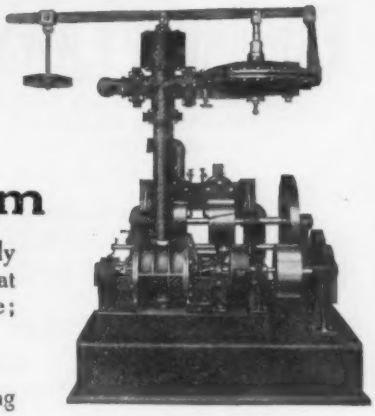

employing ordinary city gas. This device is easily installed and delivers gas and air under pressure at absolutely correct mixture; produces a clean blue flame; singes thoroughly and uniformly.

It is equally effective for heating calenders.

Flame burns in confined space; is self-sustaining and combustion perfect.

Results Guaranteed
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This mixture is regulated at machine instead of burners.

Mills use the KEMP AUTOMATIC GAS SYSTEM, making a big saving in gas consumption.

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ALBERT BIRCH, TEXTILE MECHANICIAN

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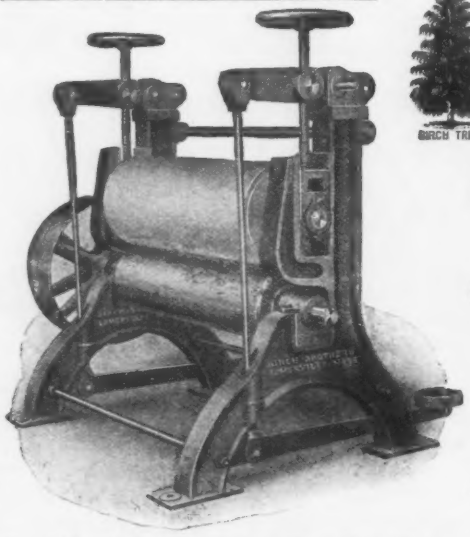

Starch Mangle.—This is the two-roll machine, with brass and rubber rolls. Mangles built with rollers of any material or number desired. Send for circular.

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Sent on trial most anywhere

Sews any fabric, thick or thin, wet or dry, without change

Fine Stitch or Coarse Stitch

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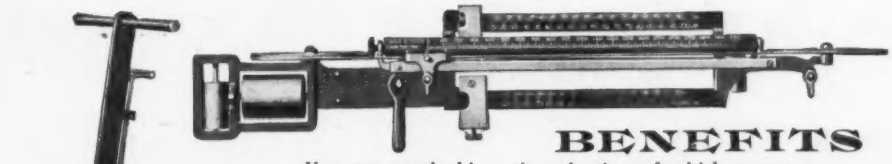

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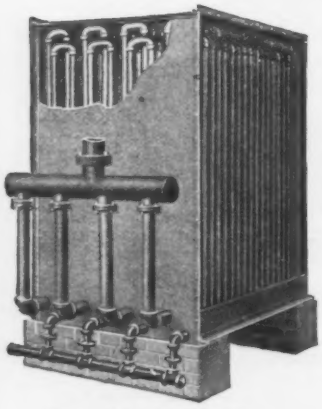
The Use of Fans in Textile Mills is Growing

more extensive every day



The largest individual Tenter Drying Apparatus in this country — that of the Arnold Print Works, North Adams, Mass., uses

Niagara Conoidal Fans and Buffalo Return Bend Heaters

Repeat orders from the largest mills, among which is that of the American Printing Co., prove conclusively that the capacity of Tenter Machines is increased by properly applied Tenter tubes.

Our Engineering Department may be consulted without charge on any Textile Mill Application.

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There's enough behind AMERICAN PULLEYS to make them the safest buy for you.

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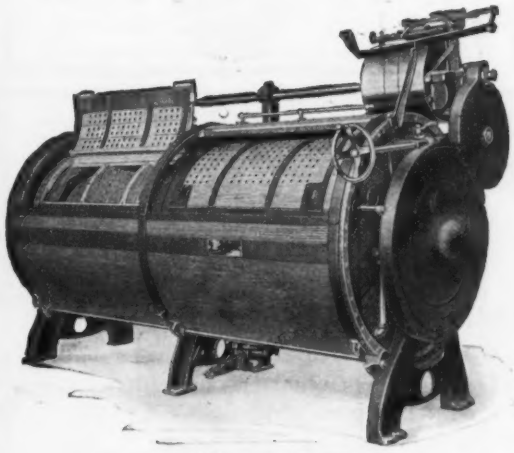
AMERICAN FULLING WASHER



ACME WASHER

Supplies the most up-to-date method of fulling woolens. Gives unequalled results with economy in time and labor. Superior construction to any other type of fulling machinery, assures long life.

Made in any length up to 120 inches and with any desired number of compartments.

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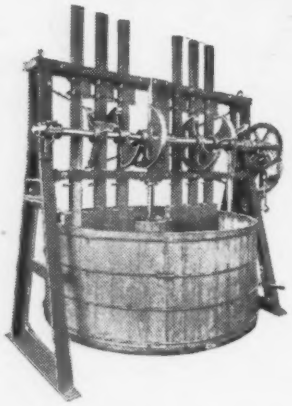

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Positively uniform treatment,
Goods easily accessible,
No dragging of the goods,
No clatter of Wheels or Gearing,
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Available area for goods in one washing, 31 sq. feet,

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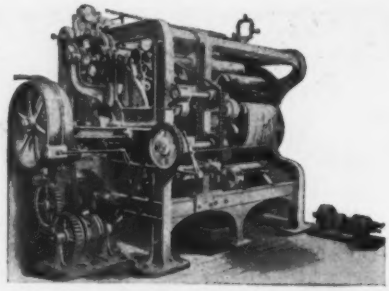

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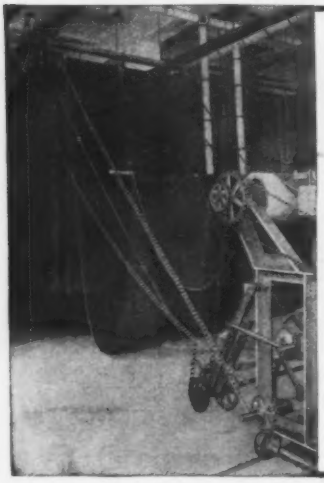

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For shrinking woolen, worsted and cotton goods; drying oilcloth, or waterproof cloth, and curing rubberized cloth.

Can be attached to any machine or operated separately

In use by the United States Quartermaster department for shrinking uniform cloth.

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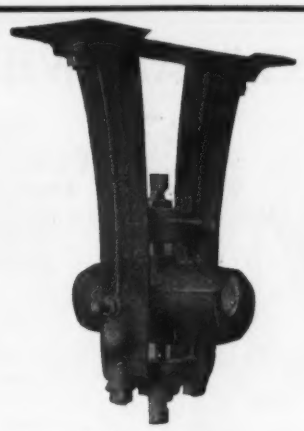

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Engineers—Founders—Machinists

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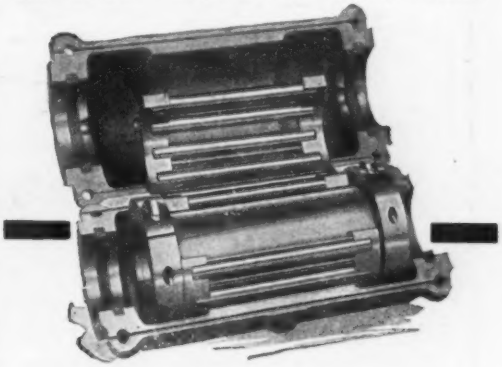


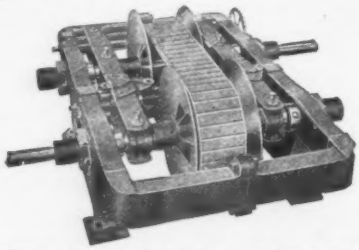
Precisely the Speed You Need Just When You Need It

Keep your machines running at the correct speed all the time, for any kind or weight of goods.

"The Reeves" **Variable Speed Transmission**

gives a wide range of variation, and positively any speed between fastest and slowest.

It is the ideal drive for Tentering Machines, Dryers, Printing Machines, Mangles, Singers, etc.



You change the speed with the machine running—there's no guess-work about it—watch the work go on while you turn a hand wheel and get exactly the speed you want.

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can be used in any part of a textile plant where piece-end sewing is required, and so overcomes, all objections to a power machine.

The cloth is stretched to a large feed wheel connected to looper shaft, which can be instantly detached.

By a device peculiarly our own, needles do not break and stitches are all uniform length, and feed of cloth wheel is positive.

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Satisfactory operation of all machines guaranteed.

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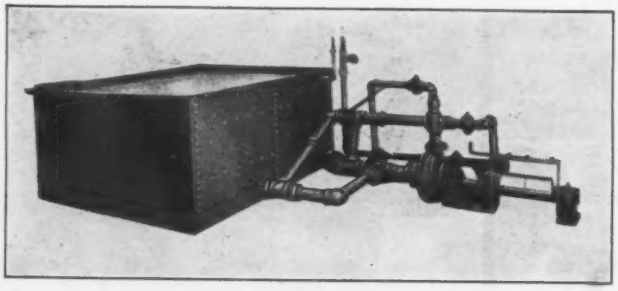

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We also guarantee relative reduction in cost of bleaching with lime, and results that are unsurpassed.

Send us samples for treatment, and permit us to visit with you where the machines are in operation.

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Giles
TRADE MARK

If You are Interested in

Machines for
Dyeing or Bleaching Yarns

Cotton
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Write us to send you an estimate of cost of installing an equipment as well as the economies in labor and steam that can be made.

John H. Giles Dyeing Machine Co.

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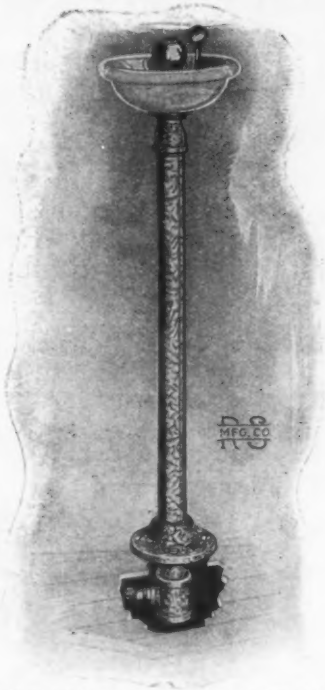

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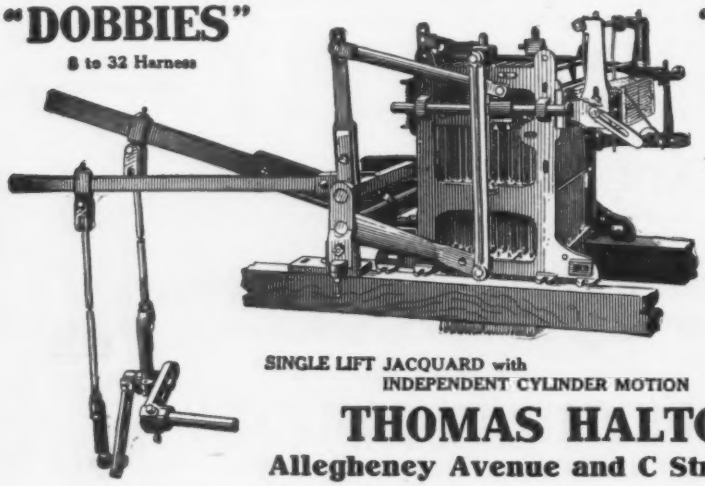

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It is used in Laminar Fibre Roving Cans, to obtain an extra amount of service, and greater length of life. With electrically welded tinned steel rims, heavy kicking bands, etc., you get a Roving Can that is an unusually profitable investment.

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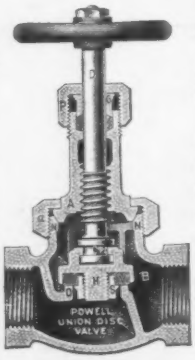

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2. Metal distributed to meet the most wear.

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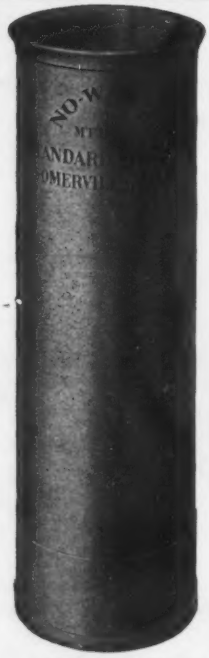

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Seamless Hard Fibre Roving Can

It does not have the riveted seam that strains and breaks the sliver

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ABSOLUTELY SMOOTH

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Fibre and Steel Clad Cars
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resulting from the hot, stuffy or "steamy" atmosphere of the room that is not properly ventilated, that is to say

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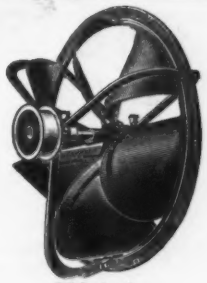

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WITH NO BACK DRAUGHT
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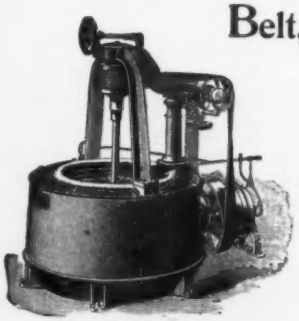
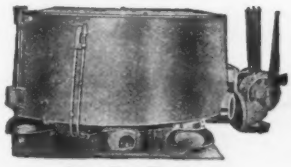


Over Driven Extractor



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Requires Absolutely No Attention

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Self-Equalizing Expansion Joint

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It is built on a correct idea, that of corrugations, each of which is compelled to take up its proper share of the expansion. For long service it can't be beaten.

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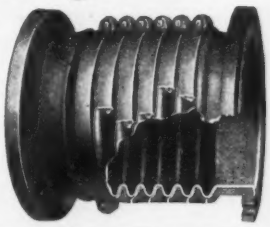

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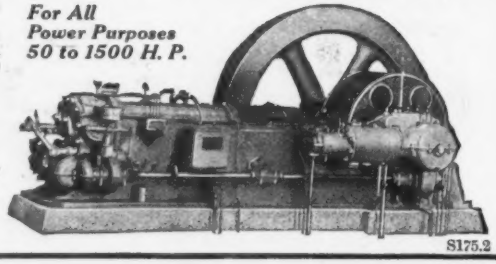
For All Power Purposes 50 to 1500 H. P.



S175.2

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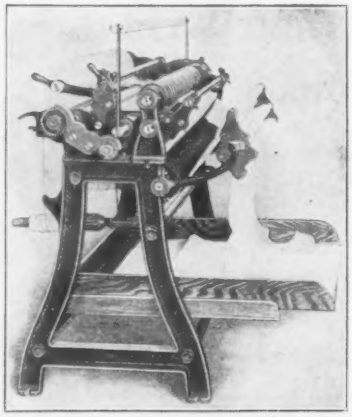
Cuts Cotton or Woolen Fabrics, Knit Goods, etc. for Bindings, Facings, Fronts, Button Stays, etc.

Straight or Bias



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Dodge's Patent Hot Forged Picker Pins

are lagged in White Pasture Beech or Rock Maple of the best quality. Warranted not to shrink nor split

If You Want the Picker That Leads

GET THE

Dodge Rag or Shoddy Picker

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BAGGING MACHINES
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The big increase in Gandy sales—our sales have grown every year for 36 years—is proof that Gandy Belt does give satisfactory service. What it does for others it will do for you.

Gandy Stitched Cotton Duck Belting

much less than the cost of either leather belting or rubber belting it often does the work satisfactorily, where other types of belting fail to give results.

You will see how water, oil and dustproof it is; how it grips on the pulleys—how it W-E-A-R-S!

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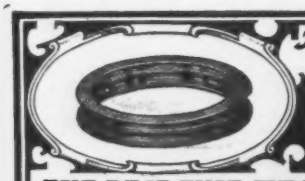

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THE BEST THAT EXPERIENCE CAN PRODUCE, THAT MONEY CAN BUY

Loom Fixers

Your Supply Box is incomplete without it.

Does not fly around and make grease spots on your warps.

Sold on merit only, as the price is higher than most.

Write for free half pound, or to save time, order 30, 50 or 100 lbs.

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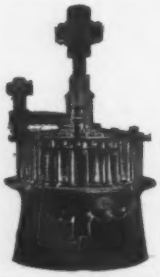
AND WHY IT IS BEST IN

POWER, SPEED AND ECONOMY



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These are points of merit established by scientific and experimental tests.

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Permanent Colors Create Permanent Trade

The insistent demand of the consumer for Fast Colors makes it imperative that the Retailer, the Jobber, the Cutter-up and Textile Manufacturers recognize the question, Fastness of Colors, as a most important one

Indigo The introduction of synthetic Indigo by the Badische Anilin-& Soda-Fabrik in 1897 greatly lowered its cost, simplified its application and placed it on a scientific basis. The immediate practical result has been that Indigo is used on an ever increasing scale in the production of overall goods (denims) for working garments worn by artisans of all classes everywhere, as well as for navy blues with white designs, in percales, and similar fabrics which are so largely used the world over for women's house and working dresses. Nothing has yet been found which is as well suited as Indigo for these and many other purposes, since it combines minimum cost, brilliancy of color and satisfactory fastness. In fact, the word "Indigo" to the consuming public is a guarantee of a durable and satisfactory color.

Indanthrenes Unfortunately, however, Indigo produces only a Blue, while the trade requires every shade in fast and brilliant colors. To Dr. Rene Bohn, Director ot the Badische Anilin-& Soda-Fabrik, Ludwigshafen a/Rhein, should be given credit for the discovery of the series of dyestuffs derived from Anthracene, known as Indanthrene Dyes, which produce fast colors in every desired shade and tone. The introduction of these dyes in the cotton industry has created a new standard for fastness and brilliancy, in which combined respects they excel any colors heretofore known. Indanthrenes are actually permanent while the fibre lasts, meeting therefore every trade requirement, a fact so well demonstrated that today the word "Indanthrene" (pronounced In-dan-threne) is synonymous with "Fast Colors." There is probably no factor of greater importance in the manufacture of cotton goods than the fastness of the colors, in that it constitutes a most attractive selling argument, increases their popularity, and broadens the market for them.

BADISCHE COMPANY

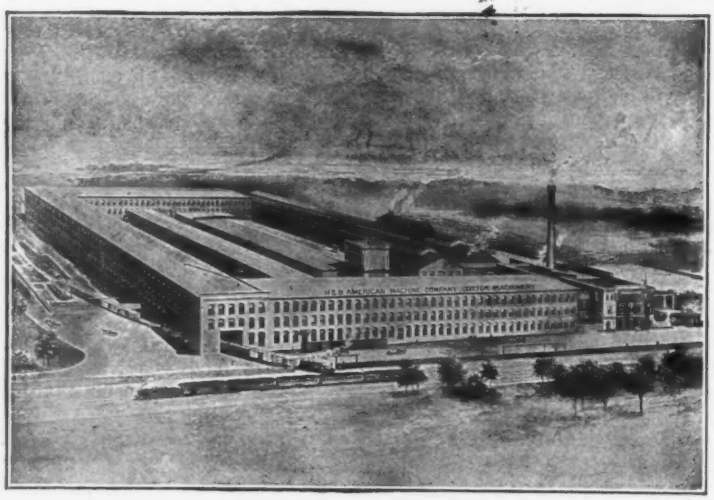
Contents for August

	PAGE
Monthly Comment	51
Determination of Crimp in Tire Fabrics	58
The Middle States Textile Manufacturers' Association	58
The Wool Goods Market	59
The Italian Cotton Industry Since the European War	61
Gun Cotton	63
The English Market for Tops and Worsted Yarns	66
CORRESPONDENCE AND NOTES — The Relation Between Production and Costs—"Straight Line" Textile Calculations—Why Worry About Dyestuffs—Textile Testing House at Philadelphia—Kapok—English Notes—Shearing Wool Goods—A Tension Regulator for Spinning Machines—Scientific Management in a Cotton Weave Room—The Scientific Drying of Textile Materials.	70
QUESTIONS AND ANSWERS	90
KNITTING DEPARTMENT — The Knit Goods Situation—An Improved Spring Needle Rib Machine—An Improved Knit Fabric—The Finishing of Knit Underwear—A Reinforced Knit Fabric—Weights of Hosiery—Flat and Balbriggan Knit Goods—Holes in Knit Goods—Warp Knitting.	98
DYEING, BLEACHING, FINISHING, ETC. — Logwood Dyes—Dyeing with Vegetable and Mineral Dyestuffs—The Bleaching of Cotton and Linen Mixed Goods—A New Black for Hosiery—Finishing Nottingham Lace Curtains—Luster Finish—Testing Aniline Oil and Salt—Shrinking Cotton Goods—A New Fast Black—Dye Recipes.	108
NEW MACHINERY AND PROCESSES	119
PERSONALS	132
NEW PUBLICATIONS	136
INDUSTRIAL NOTES	136
RECENT TEXTILE PATENTS	143
TEXTILE TRADE-MARKS RECENTLY FILED FOR REGISTRATION	144
PUBLISHERS PAGE	160
MILL NEWS	169-211
WOOL MARKET	179
BRADFORD MARKET	181
COTTON MARKET	183
YARN MARKETS	185
RAG AND SHODDY MARKET	195
SILK MARKET	197
MILL STOCKS	205

Correspondence

We solicit correspondence on textile subjects. Articles accepted will be paid for. Name and address must always be given, not necessarily for publication. Subscribers are invited to make free use of our Questions and Answers Department; correspondence is strictly confidential.

COTTON MACHINERY



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TEXTILE WORLD RECORD

AUGUST, 1915

Monthly Comment.

The Dyestuff Situation

The dyestuff situation is more acute with no prospect of adequate relief when the present stock on hand is exhausted. Several mills whose product is exclusively indigo dyed or colored goods have shut down. Others are postponing the evil day by carefully husbanding their resources and substituting goods requiring very little color in place of solid shades. Mills with a surplus of a particular kind of dyestuff are exchanging with those who can supply something that they require. Those familiar with the German situation see very little prospect for relief from abroad, unless the fundamental conditions laid down by Germany are complied with, that dyestuffs will only be allowed to leave Germany when American cotton or some equally desired commodity shall be shipped in exchange, and to these conditions Great Britain objects, although she will consent to allow several cargoes of dyestuffs to pass her blockade.

A company has been organized, composed of large consumers of dyestuffs, headed by William A. Mitchell, who was active in connection with the earlier shipments from Germany. They hope that direct trade negotiations may accomplish something. The reports in the German trade papers indicate that Germany may not be able to spare the necessary dyestuffs even if the embargo was lifted, as very much higher prices now prevail there, due to the demands upon the great chemical works for war products which compel the curtailment of strictly dyestuff manufacture. It is probable that with their customary talent for organization the Germans will arrange the output of these works in such a way that only those colors will be produced which are most needed for military purposes and pressing civilian demands.

Thomas H. Norton, of the Bureau of Commerce, who has been especially assigned to the study of this question, believes there is something to be hoped for through reciprocity with Swiss manufacturers of artificial colors who now find themselves cut off from supplies of coal tar, crude and intermediate products, and who may soon be forced to close their works unless they are able to secure these crudes from theUnited States. He states they are in need of aniline oil, benzol, toluol, and napthalene, which would be paid for by an equivalent amount of finished dyes. A similar arrangement has been in force with Great Britain for some months past which is claimed to have contributed materially to lessen the scarcity of colors in Great Britain, but the recent demand for benzol and tuloul in the manufacture of high explosives makes it no longer possible for the Swiss works to obtain these crudes from that country, and under these circumstances the manufacturers of the Swiss works look to America for relief.

A further modification of the plan sug-

gested is close connection and co-operation between individual Swiss companies and individual American companies already engaged in the manufacture of dyestuffs, but limited hitherto to a narrow range of products. The Swiss concern would supply the necessary technical knowledge and staff to extend the output, and the American concern would guarantee a proper supply of crude and intermediate products. This plan suggested by Mr. Norton is interesting, but does not promise great results.

The American dyestuff and chemical manufacturers are doing their utmost to meet the emergency, as has been reported from time to time, but only limited relief can be expected from them for some time. The market has been scoured to discover any small stocks that have been overlooked and it has been reported that even the drug stores who sell dyes for family use have been canvassed in the hope of ekeing out the meager supply.

The use of natural dye woods is increasing to a great extent and the return to old methods long since abandoned is increasingly common. There has been a great demand for dyers familiar with these old methods and much consultation of old formulae.

While the supply of artificial dyestuffs lasts and unequally distributed, as it is bound to be, those fortunate or far sighted enough to have laid in large stocks will prosper at the expense of those less favored. But if conditions do not soon change to permit the importation of German dystuffs, there must soon come a time when American consumers will face a famine in many lines of goods which cannot be duplicated with the same guarantees as before. Then the consumer must take what he can get rather than what he desires. If it is impossible to procure indigo dyed denims, the consumer will have to take brown, gray or some other color or else go without. There still appears to be much skepticism on the part of the buyers as to the seriousness of the situation. When they realize the new conditions and are willing to make proper allowances for them, the position of the manufacturer will be much more comfortable.

Stock and Consumption of Cotton in the United States

The Bureau of the Census has issued the following report of the cotton consumed and on hand, and the active cotton spindles in the United States, also the imports and exports of cotton for the 11 months ending June, 1915, compared with the figures for 1914:

	1915 Bales	1914 Bales
Consumed	5,100,322	5,177,745
On hand June 30		
At mills	1,622,499	1,156,599
In outside warehouses	2,085,347	630,487
Active spindles, June	31,220,592	30,948,048
Imports:		
Egypt	228,538	125,277
Peru	10,165	12,185
China	22,713	17,434
Other	85,155	82,302
Total	346,571	237,198
Exports:		
United Kingdom	3,712,592	3,412,068
Germany	242,661	2,744,672
France	655,421	1,084,005
Italy	1,056,572	492,422
Other	2,632,660	1,291,423
Total	8,299,816	9,024,590

The Wool Grower and the Wool Trade

The Bureau of Animal Industry of the Department of Agriculture has recently published a pamphlet for the instruction of the wool grower and the wool trade which discusses the preparation of wools for market and explains the effect upon the value of wool of the different factors which are under the control of the grower. We have recently commented upon several cooperative movements undertaken by the wool growers in their own behalf for the improvement of their clips and the continued and serious agitation of this subject may, we hope, have some beneficial effect in improving the condition in which American wool is now marketed. The Government departments have expended millions of dollars for the benefit of the cotton growers and the cotton industry generally, and only an infinitesimal amount in comparison for the benefit of the wool growers and wool trade. It is to be hoped that no efforts will be spared in be-

half of this great industry, especially since the present war has emphasized as never before the importance of American grown wool for the American manufacturer.

If the wool grower can, by adopting certain fundamental rules in the preparation of his clip for the market, enhance its market value appreciably, the added profits will be a greater inducement for wool growing. Some interesting figures are given in connection with the canvass made by the Bureau of Animal Industry to determine the extent to which American wool growers follow the best practice. The report states that:

"Because of the way in which the names were secured it is probable that the 383 replies received were from men whose methods are superior to those generally followed in the same localities; consequently the percentages shown at the foot of the table are much higher than would be reported if it had been possible to receive replies from all wool growers in the States shown. The results of this canvass are as follows:

RESULTS OF INVESTIGATION OF METHODS OF WESTERN SHEEPMEN IN MARKETING WOOL

STATE	Number of sheep shorn in 1913 by persons reporting	Number of persons reporting	Number who sacked ewe lamb and buck wool separately	Number who sacked blacks separately	Number who used paper twine	Number who sacked tags separately	Number of cases where dockage was made for tags
Arizona	134,422	18	9	6	2	9	3
California	125,302	26	10	5	8	4	7
Colorado	109,695	13	6	8	8	3	4
Idaho	336,249	62	32	48	49	45	26
Montana	518.049	82	46	28	44	51	37
New Mexico	92,011	13	6	10	3	5	..
Oregon	195,246	37	25	23	34	26	11
Utah	309,583	71	17	58	61	24	36
Washington	77,419	13	7	..	11	3	4
Wyoming	371,029	48	32	40	39	33	13
Total	2,269,005	383	190	226	259	203	141
Per cent of total	....	....	49·3	59·0	67·6	53·0	....

Practically one-half the correspondents separated ewes', lambs', and bucks' wool when sacking; 59 per cent. put up the black wool separately; and 53 per cent. sacked the tags separately. It must be borne in mind, as stated before, that these percentages are undoubtedly much higher than would be the case if it were possible to secure replies from all woolgrowers in any section or State.

The American wool clip is sold by the growers unclassified and in the main very poorly handled. The way in which each of the various defects injures the manufacturing value of the wool has been explained in previous pages. These defects have come to constitute a fixed charge against American wool, which does not apply to wools coming to this country from Australia and some other countries.

Probably the lack of any form of classifying or grading before selling causes the greatest loss to our woolgrowers. The buyer, whether he represents a mill or a firm that buys wool to be sold again after grading, is expected to place a fair valuation upon clips in which there may be many sacks each containing three or four grades of wool. The difference in the scoured values of those grades may not be so serious, but the difference in shrinkage, say, between quarter-blood and half-blood fleeces, is a very great one, and there is no possibility of doing more than making an estimate of the average shrinkage and value of the clip as it is offered. Manifestly the buyer must place the shrinkage estimate sufficiently high to protect himself from loss. In order to get a certain quantity of a particular grade he must buy, even of graded wools, a lot containing other grades that must be sold after sorting.

Even after grading in the eastern warehouses American wools often sell below foreign wools of similar grade and quality because the latter have been skirted and carefully classified before baling, while American fleeces go to the mills in the same shape as they leave the shearing floor, being grades so far as is possible without untying the fleeces.

Comparative results from two lots of wool, one American (Idaho Soda Springs) and one foreign (Australian 50s crossbred, of the same grade and the same value on a scoured basis, as given by a Philadelphia manufacturer, are shown below:

Sorting and scouring test of domestic and foreign wool.

	Soda Springs	50s Crossbred
Cost in grease, cents	18.5	28.0
Loss in weight, per cent.	1.96	.87
Shorts, strings, clips, low, etc., per cent.	11.25	.17
Main sorts, per cent.	86.79	98.96
Actual shrinkage main sorts from total wool purchased, per cent.	57.89	37.36
Shrinkage of net weight of wool scoured, per cent.	51.46	36.70
Actual cost main sorts in grease, cents	20.06	28.29
Cost per pound clean, per cent	41.32	44.69

As is shown by these figures the manufacturer bought the American wool for 3.37 cents per clean pound less than exactly similar foreign wool. This was possible mainly because the former lot contained only 86.79 per cent. of what was really wanted, against 98.96 per cent. in the case of the foreign wool that has been skirted and put up without string. The amount and value of the off sorts in American wool varies, and to the extent of that variation the purchase of these wools involves uncertainty that partakes of gambling and necessitates buying at a figure low enough to cover loss in use or sale of the part not wanted and the greater expense of sorting.

It is the grower who eventually pays all penalties and suffers most of the loss due to inferior preparation of wool. It must not be overlooked that the Australian sheep raiser incurs considerable expense in his method of preparing his wool for the market. He enjovs some advantages favoring the production of extra quality, most marked in the case of fine wools. In the case cited above the wools were of the same grade and the comparison is wholly fair, as the net result shown is on the scoured basis and for wools of equal clean value.

—:—

A Tariff on Dyestuffs and Chemicals

A significant indication of the recognition of the principle of protection is seen in the favorable consideration given by the present Administration to the idea of providing an adequate tariff which shall properly protect American dyestuff and chemical industries against foreign competition after the war. A large amount of capital has already been invested in the emergency plants which have been established, but some assurance of protection will undoubtedly release considerable additional capital for investment in such enterprises. Equally significant is the willing consent of the manufacturers who are users of these dyestuffs to favor protective measures even though the tariff would increase the price they will have to pay.

At a recent meeting of the executive board of the National Association of Hosiery and Underwear Manufacturers the following resolutions along this line were unanimously adopted and copies will be sent to the President and members of Congress:

"Whereas, the hosiery and knit goods manufacturers, in common with nearly all branches of the textile industry of this country, are suffering because they are unable to obtain dyestuffs which have heretofore been imported, and, whereas, it is entirly feasible and practical to manufacture said dyestuffs in this country, and whereas American capitalists stand ready to furnish capital for the production of such dyestuffs if sufficient protection is afforded to guarantee that their investment will not be wiped out by foreign competition after the termination of the European war.

"And, whereas, the need of dyestuffs in said industry is becoming more acute and serious, therefore be it

"Resolved, That we, officers and directors and members of the advisory board of the National Association of Hosiery and Underwear Manufacturers, place ourselves on record as favoring the prompt enactment of new tariff regulations for proper changes in the present tariff, guaranteeing adequate protection to persons, firms or corporations contemplating, or who may be induced to develop the American dyestuff industry."

No conceivable tariff is likely to maintain prices on the basis of present figures to which the trade is rapidly becoming educated. Some of our textile manufacturers have been ready enough in the past to advocate protection on goods they make, but loath to grant protection to the materials produced in this country which they use.

—:—

Textile Unions

There has been considerable discussion of late and some openly expressed dissatisfaction in textile labor union circles with the organization of the United Textile Workers, which is a branch of the American Federation of Labor. One of the subordinate associations, the Fall River Loom Fixers Union, has seceded and another loom fixers union, comprising the New Bedford, Pawtucket, Lowell and Somersworth branches, is also considering an independent organization. The United Textile Workers does not appear to be a very closely knit body. There is said to be more or less internal dissention. This may be due to the fact that its efforts are diffused over a widely diversified industry as textile manufacturing, with its cotton, woolen, worsted, knit, carpet and silk ramifications. There are said to be about 17,000 members in the various cotton labor unions. There is less than 10 per cent. of the cotton mill operatives in New England and only about 5 or 6 per cent. of the operatives in the cotton mills of the country. In the South the labor unions have made very little progress.

Wool, Tops and Yarn

The imports of wool, tops and wool yarn for the twelve months ending June, 1915, are reported by the Bureau of Foreign and Domestic Commerce as follows:

Clothing and Combing Wool, Free

July, 1914 .....lbs.	13,680,588	$4,720,650
August	11,700,980	3,089,974
September	9,096,205	2,315,488
October	7,543,479	1,844,032
November	2,909,260	629,416
December	962,219	194,810
January, 1915	7,445,517	1,753,210
February	16,092,943	3,804,491
March	47,393,129	11,057,566
April	47,927,295	11,654,634
May	40,585,106	9,715,317
June	31,537,182	5,973,152

Carpet Wool, Free

July, 1914 .....lbs.	6,150,565	$1,028,569
August	4,777,641	769,841
September	4,705,674	773,637
October	3,942,256	641,568
November	2,541,724	457,522
December	1,955,252	328,200
January, 1915	4,191,043	604,496
February	5,414,962	786,138
March	13,393,129	2,347,774
April	7,639,546	1,254,783
May	7,210,512	1,179,929
June	3,883,682	693,018

Mohair, 15 per cent. ad val.

July, 1914 .....lbs.	309,250	$101,930
August	238,490	93,848
September	407,651	141,040
October	470,995	169,545
November	443,466	171,401
December	308,911	115,648
January, 1915	298,906	90,553
February	481,013	133,920
March	945,083	268,781
April	267,851	69,350
May	322,532	87,853
June	807,415	189,557

Tops, 8 per cent. ad val.

July, 1914 .....lbs.	1,064,988	$578,152
August	396,230	191,774
September	563,447	270,546
October	433,688	192,899
November	193,878	79,848
December	75,468	27,615
January, 1915	105,833	39,174
February	72,168	35,016
March	73,285	39,556
April	78,771	36,552
May	166,735	72,588
June	144,826	98,777

Yarn, 18 per cent. ad val.

July, 1914 .....lbs.	755,956	$544,974
August	307,825	223,713
September	277,355	186,235
October	374,420	247,750
November	83,234	66,712
December	142,255	97,064
January, 1915	121,463	90,628
February	117,985	84,065
March	84,766	66,992
April	30,664	24,724
May	83,964	63,403
June	36,298	22,811

Solving the Dyestuff Problem in England

Deprived suddenly of a supply of German dyestuffs, Great Britain and the United States face practically the same difficulties in providing their industries with new sources of supply. For that reason the development of the enterprise in England is of special interest to the American trade. What has been accomplished by the British Dyes, Limited, and the plans for the future were recently outlined in a statement by J. Falconer, the chairman of the company at the first meeting of the corporation. His statement is reported by the "Guardian" as follows:

"The chairman said they had received in cash as paid up ordinary share capital and on loan from the Government the sum of £1,018,000. The preliminary expenses amounted roughly to £9,000, and therefore £1,009,000 remained. It was estimated that they would have to pay—the exact figure had not been ascertained—£422,000 for the purchase of Read Holliday & Sons, Ltd., undertaking. There would then be a balance of cash capital available of £587,000, and the company also had uncalled share capital amounting to £492,000. The total of these sums was £1,079,000. They could say roughly that the cash resources of the company were £1,000,000. The company had complete possession of Read Holliday & Co.'s works, and they had already doubled their output in weight of dyes. Plant had been ordered, and most of it had been delivered, which would still further increase both the output and the variety of dyes manufactured. That might seem a large step forward, but it was nothing like what they must do to accomplish the company's purpose. With regard to the output from Read Holliday & Co.'s works, this company had concentrated their efforts on the things which they could produce which were most serviceable to the trade. The trade had shown themselves willing to adapt themselves to the things which the company could produce, and that spirit of mutual accommodation would have to continue if they were to achieve the best possible results in these difficult times. If any shareholder thought he had a grievance he might communicate it to him, so that an opportunity might be found for discussing the matter.

An important factor in determining what supplies the company could provide would be the amount of dyestuffs obtainable from Switzerland.

In times past the Swiss manufacturers had found England a good market, and since the war began the Swiss manufacturers had shown a very friendly disposition towards their British customers. It was the desire of this company to help the Swiss manufacturers as liberally as the conditions would permit and on terms as generous as could reasonably be asked for. Within the last few days the German dye manufacturers had threatened to refuse to supply dyes to the Swiss consumers if they exported dyes. They could not expect him to enter upon a discussion of the relations existing between this country and the Swiss people, but he believed the shareholders would agree with him when he said that if, as he expected, the Swiss people refused to break off friendly relations with this country, and continued to deal with them, they would not be likely to forget it when the war was over.

When they came to consider the future policy of the company it was necessary to keep in mind the fact that they had two distinct objects in view, and confusion arose if they mixed them up. In the first place they had to deal with the existing emergency, and in the second place they had to lay the foundation for a national supply of dyestuffs, so that in the future they would be permanently independent of the German supply. With regard to the first consideration they had laid down the rule that the question of profit was entirely subordinate, and that the primary concern at present was to secure a supply of dyes for the country. He did not mean that their products would be sold at an unremunerative rate, but in deciding what they should make themselves and what they could obtain from other sources, or what methods of cooperation between themselves and others should be adopted, they would place first the interests of the consumers and shareholders, and leave the question of profit to look after itself. They would be able to divide only 6 per cent. in any case, and what they did make would be saved up for the purpose of helping them to establish a national dye industry. He thought that was the best purpose to which any profits made during the war could be devoted.

They had realized the necessity of increasing the capacity, if the needs of the existing situation were to be met, for manufacturing intermediate products and adding to the variety of dyes. They had extended the plant at Read Holliday's, but they were convinced that they must establish new works and set up the best organization that they would get to deal with the difficulties of the situation. They did not consider the difficulties insuperable in the case of a large number of the products which they intended to make during the war.

The question of a permanent supply was undoubtedly one of real difficulty, but they had resolved to make a beginning. Mr. Falconer went on to refer to the appointment of a research department, and he spoke of the work which Dr. Morgan, who had been invited to become the head of the department, has done in Dublin in connection with the manufacture of dyestuffs. The technical committee which was to be appointed would combine export theoretical knowledge with practical experience in the manufacturing of dyes and the handling of men in connection with it. That was an effort to combine science with industrial management, which they had often said ought to be made, but which probably had never been tried in such difficult circumstances or on such an expensive scale.

Mr. Falconer also described the arrangements in prospect for the purpose of ensuring a supply of well-trained chemists for research work, and referred to the invitation to the heads of the principal universities who had devoted themselves to organic chemistry to form an Advisory Council to help the company in that matter. The names of the Advisory Council had been published in the papers, and all but one, who was not in a posiiton to reply at the moment, had cordially agreed to do everything in their power to help the enterprise. (Cheers). Dr. Meldola, who had consented to be the chairman of the Council, had written as follows: "Never in the history of British industry has a more powerful organization of scientific cooperators been formed for the promotion of a particular brand of manufacture. This is to be regarded not only as a healthy indication that the company means business, but, from our point of view, the formation of this Council conveys the all important lesson that the interdependence of industry and science is now recognized as a principle by the dictorate. It is hardly necessary for me to assure you how cordially this recognition will be endorsed and approved by the whole of the scientific world." (Cheers).

The names of the members of this Council were an answer to those who said there was no scientific ability in this country equal to the task of making dyes.

In addition to setting up this research department and to having separate laboratories in the works, the company proposed to take advantage of special arrangements which had been in existence at the Leeds University for study and experiment in the manufacture of dyes. He believed that ultimately they would succeed, not only in doing as well as has been done in the past, but in taking the lead in the manufacture of aniline dyes and the products arising therefrom. (Cheers). They had decided to proceed at once with the erection of the new plant and the new works. It must be obvious that to reach the goal at which they were ultimately aiming the million of cash capital they had would not be adequate, but it was enough to do a great deal with, and they believed that if they succeeded the shareholders would provide in the future whatever additional capital was required for extensions. (Cheers). Things had occurred which made every right-thinking Britisher determined that never again, if he could possibly avoid it, would he be dependent upon Germany for anything he needed. (Cheers). Therefore he was convinced that, though it might cost 25 per cent. or 30 per cent. or even 50 per cent. more to put down the additional plant now than it would cost later on, they should proceed with the extensions at once. At the earliest possible moment this country must be placed in a position of independence in the matter of dyes. (Cheers).

The European Textile Industry

THE TEXTILE TRADE IN ENGLAND

The Textile Mercury reports a shortage of male labor in England, owing mainly to the youths and men having joined the army or navy. The lack is considerable in the cotton industry where there is a dearth of male piecers. In the woolen districts employment still remains good. At the end of May there was an increase of 0.9 per cent. in the number of persons employed as compared with twelve months ago, while the increase in the amount of wages was 19.2 per cent. The hosiery trade continues to be very good, employment having been increased as well as the openings. Employment during May was less than it was twelve months before, while the wages were about 1s per week higher.

GERMANY'S SUPPLY OF COTTON

As a result of Italy's entrance into the war, bringing with it a complete stoppage of imports of raw cotton into Germany, the German Government has been forced to adopt measures for making the cotton on hand last as long as possible. The situation is outlined by the "Wochenberichte der Leipziger Monatschrift fuer Textil-Industrie" as follows:

"Since the importation of cotton through Italy ceased the German Government has been making an investigation to determine how long existing stocks will last in case of a prolongation of the war. On June 3 the raw material department of the Ministry of War had a conference with the leading representatives of trade and industry regarding the immediate conservation of cotton stocks. After the conference it was announced that no difficulties were likely to be encountered, owing to the stocks on hand and the numerous expedients by which they could be stretched out. Accordingly it will be necessary for the present to enforce strict economy in the use of cotton in the interest of the army and the public. Among the measures to be adopted is a discontinuance of the use of cotton in the production of articles of luxury. The policy of the Government will be shaped first by the requirements of the army and after that by the needs of the civil population.

GERMAN WAGES AND COST OF LIVING

Reports of wage increases to offset the increased cost of living in Germany continue to show the low wage level that has been and still is prevailing in that country. In its issue of June 16 the "Wochenberichte der Leipziger Monatschrift fuer Textile-Industrie" reports that the textile firm of Herminghaus & Co., Elberfeld, has granted wage increases as follows because of the increase in the cost of living:

Women and girls, 1 mark (24 cents) per week.
Unmarried men, 1.50 marks (36 cents) per week.
Married men, 2.50 marks (60 cents) per week.

In addition to the above-named increase, married men are to receive an additional .50 mark (12 cents) per week for each child in the family, the total for all children in one family not to exceed 2 marks (48 cents) per week.

RISING PRICES FOR YARN

The "Wochenberichte der Leipziger Monatschrift fuer Textil-Industrie" of June 16 states that because of the prolongation of hostilities and recent developments in the war the German Association of Cotton Knitting Yarn Manufacturers has found it necessary to make a further advance of 40 pfg. (9.6 cents) per kilogram (4.4 cents per pound) in the price for cotton knitting yarn. Orders will be limited to deliveries not later than Aug. 31, 1915. Owing to the extraordinary conditions prevailing no guarantee of delivery will be given. The total increase of price by the Association since the fall of 1914 amounts to 1 mark per kilo (11 cents per pound).

INCREASED COST OF DYEING TEXTILES

The "Wochenberichte der Leipziger Monatschrift fuer Textil-Industrie" reports the following announcement by the Chemnitz Association of Dyers:

"Owing to existing conditions prices for dyeing hosiery and yarn for knitting and weaving must be increased, but the increase will be kept as small as possible and adjusted to meet the increased cost of dyestuffs, chemicals, coal and other materials, as well as of labor. Owing to the rapid and continuous advance in the cost of dyeing materials, it is impossible to frame a price list for dyeing for any fixed period. For this reason customers must apply directly to the dyers for prices for this work.

The Breslauer Zeitung, published in Breslau, the great industrial center on the Oder River, in Selesia, Germany, sums up the woolen industry of that section and of the whole of Germany as follows:

Most of the mills are engaged at only half their capacity, since the exports, which usually play such an important part in the industry, have been

almost entirely cut off. Those factories which produce staple goods, such as shirt flannels, aprons, bedding, etc., which may be used for military purposes find a good sale; but in all other branches of the industry which are dependent upon the whims of fashion, business stops.

Many concerns which had large stocks of ready-made goods before the war equipped their factories for the production of army cloth and other military goods, such as woolen underwear, blankets and flannels. The districts northwest of the Rhine Provinces and the Wuppertal were very busy. In Aix la Chapelle, Australian wool stocks were manufactured; in Saxony and Thuringia, German stocks were used. The large stocks of export goods which had been a burden before the war now suddenly experienced a lively demand. The wool industry adapted itself splendidly to the changed requirements. Gadbach "buckskin" weavers, who had been manufacturing ulster material, now cut this up into blankets, which were needed in the prison camps and hospitals. All looms were soon engaged. Soldiers' coats, linings, footwarmers, etc., were also supplied. The cloak and dress goods manufacturers were also employed in making various kinds of military goods. The cord, ribbon and worsted spinning mills were also flooded with orders for the army. In the carded wool spinning mills orders came so fast that the entire output until spring has been sold in advance. In the white goods weaving mills stocks of flannels and fancy blankets were soon cleared. All mills worked overtime. Large orders for private concerns were also given, in which the dyeworks profited.

DETERMINATION OF CRIMP IN TIRE FABRICS

Dept. of Commerce, Bureau of Standards.
Washington, July 29, 1915.

Editor Textile World Record:

The attention of this Bureau has been directed to an editorial in your July issue regarding the determination of crimp in tire fabrics. To remove misunderstanding of the work of the Bureau on the part of your readers, I would request that the contents of this letter be published in your next number.

The term "crimp" did not originate at this Bureau, but has been employed by certain tire manufacturers in the same sense as the term "take-up" is often used in the general textile trade, that is, to express the decreased length of yarns in fabrics, due to the interlacing of warp and filling. We are glad to note that you observe the greater appropriateness of the former term as used. It is our opinion that "take-up" should be reserved to express the loss in length of yarns during weaving.

The Bureau claims no novelty in the method of determining crimp, except as to the method of determining the length of yarns after they have been removed from the fabric. The usual methods of determination of crimp depend either upon the judgment of the experimenter or upon a single applied weight, arbitrarily selected, for the application of tension used to straighten the yarn. The Bureau method proposed differs in that various weights are applied successively and the several resulting lengths are studied. A computation is then made to find the true length, that is, the length of the yarn as it would be if it could be straight without the use of the tension. The determination of the percentage of crimp is then made by comparison with the original length of the yarn in the cloth as in all previous methods. Of course, such a method is somewhat laborious and is practical only for accurate determinations, particularly for calibration of other methods of finding crimp.

Respectfully,
S. W. Stratton, Director.

THE MIDDLE STATES TEXTILE MANUFACTURERS ASSOCIATION

The annual meeting of this association was held on Wednesday, July 21, at the Louisville (Ky.) Country Club. The meeting was called to order by vice-president Philip S. Tuley, the president, Mr. Marrs, being indisposed. The first subject taken up for discussion was the rules for the purchasing of cotton. It was shown that the mutual allowance system is now in general use, the 3-pound franchise plan having been almost entirely wiped out. It was generally agreed that the mutual plan had worked out well. President Marrs urged that a uniform tare be made a matter of law and advised placing this question before Congress.

Accident prevention was the next matter taken up and Lee Rodman, the secretary of the association, reported having sent out a circular to the members regarding this matter This subject was given a great deal of attention, the discussion being carried on by a number of manufacturers.

The report on finances was read by Mr. Rodman who told of the work which was done during the session of the Indiana Legislature last winter at which a workman's compensation law was enacted. The next subject on the program was the discussion of costs and costs systems by Philip S. Tuley which was discussed at some length by the manufacturers.

The following officers were reelected:

Officers were reelected as follows: President, Capt. Paul J. Marrs, Henderson (Ky.) Cotton Mills; vice-president, Philip S. Tuley, Louisville Cotton Mills Co.; secretary and treasurer, Lee Rodman, Indiana Cotton Mills, Cannelton, Ind.; directors, R. A. Cochran, January & Wood, Maysville, Ky.; E. S. Hobbs, Aurora (Ill.) Cotton Mills; C. A. Young, Bemis Bros., Indianapolis, Ind.; C. N. Brown, Lincoln Cotton Mills, Evansville, Ind.

THE WOOL GOODS MARKET

New York, July 30, 1915.

The event of greatest interest in the woolen district during July has been the recent opening by the American Woolen Co. of their staple lines of worsted and wool fabrics for the spring season of 1916. There had been much speculation regarding prices, which were in all probability to set the pace for other manufacturers. The fabrics attracting the most interest were serges, of which many grades and weights are being offered. The advance in prices over those of the opening a year ago range from about ten per cent. to twenty-five per cent. Some serge fabrics remain at the figures of a year ago. They are among the higher classed fabrics said to be made of certain grades of Australian wool which were secured at a favorable time at figures lower than the present. The greatest advance on a serge price is on the lowest grade, made from quarter blood stock, which was from 67 1/2 cents to 95 cents.

One advance is particularly noticeable, as it is thirty-three per cent., from $1.12 1/2 up to $1.50 for a cheviot fabric.

The popular style No. 3,192 serge, which undoubtedly is the best seller of the entire line, has been advanced from $1.20 to $1.32 1/2.

Other lines of staple fabrics have been placed on sale at corresponding advances which have been imperative by the added cost of production, caused by the scarcity and continued advancing prices for dyestuffs and other materials of various kinds used in their manufacture.

A large order business is reported as having been done on staple fabrics previous to the formal opening, as many of the prominent clothing manufacturers, always keen for operating at a favorable time, placed their orders early for fabrics they use from season to season. They realized that goods sold and made early in the season would be dyed with the standard dyes, which are not in liberal supplies. The mills in position to assure the trade regarding their colors, are those that will secure the order business. The question of fast colors is uppermost in the minds of buyers.

The various lines of three-quarter goods were placed on sale during the month and many fabrics have met with favor. One line priced about 21 cents net, showing great ability in manufacturing and coloring, met with instant success and it is reported that during the first ten days on the market orders were secured for about 6,000 pieces with orders still coming in. Their complete success for the entire season seems to be assured.

When such goods are offered at prices that strike the buyers favorably, the clothing trade is operating freely and other lines have to wait until buyers have made general inspections of the market, after all lines are placed on sale.

As usual there are fabrics being offered below the already established standard of values and such fabrics, with an assured reputation, have met with a liberal patronage. The eagerness of manufacturers is indicated by the fact that some lines are being offered at prices lower than could be obtained for them. One prominent line of fancy all-worsted goods, which has been shown quietly since sometime in June, is reported as being practically sold up for the greater part of the season at an advance of only about eight per cent. over the opening price of a year ago.

The high prices for all-worsted fabrics have created a demand for cotton warp

goods and all cotton worsteds which are sold at much lower prices. Many lines are being offered and it remains to be seen how they will be received by the trade. They are expected to fill a place on the market that has been covered by low-grade all-worsted goods on which prices have been advanced to a point where they cannot be used in garments to sell at a certain price.

The demand for summer or tropical fabrics has continued and sales have been very large. These fabrics are very popular and apparently are to have a large part in the business. The appearance in the streets of the city of many suits made of tropical cloths is evidence of their growing popularity. The new cloths, in darker colors for the season of 1916, are better adapted for general wear in the Northern States and will add largely to their use another season.

Many mills that have been busily engaged to full capacity on army contracts have run out of the work, as but few new contracts have been offered for sometime. Such mills are getting out their usual lines of samples for the clothing trade, which they did not do for the fall and winter season of 1915.

There are a number of mills which do not care for army contract work, as the most profitable opportunity for such work has passed. The new specifications and other requirements have become so onerous that the work is not in favor with many manufacturers.

The British mills are making many goods for their allies which has resulted in a great slackening in demand from this country for such goods. The terms of payment has also has considerable to do with the transfer of the business to British mills. Gold is held closely abroad where it is urgently needed, and this, combined with the high rate of exchange, has had a powerful influence in retaining the manufacturing abroad.

Exports of woolens and worsteds for civilian purposes have become an important factor on the market and indications are that they will be considerably increased. Inquiries for woolen fabrics for both men's and women's wear are coming from all quarters of the globe, including China, Australia and South America. Some countries having been supplied by Germany are looking to this country for their needs. In fact, there is no other country for them to look to just now for woolen fabrics. If we are to supply the greater part of the world with woolens our mills should have plenty of work at profitable prices, unless some over-anxious manufacturers should make prices that would mean a profitless business.

The coming season will no doubt be the first when practically no importations of woolens will be made and our manufacturers should take advantage of the unusual situation.

Canada has become a large user of our low-grade, three-quarter goods and many sales of fabrics around ten to fifteen cents per yard have been shipped across the border. The British and French are also making purchases of various fabrics and the demand is constantly increasing.

During the fall and winter season the mills making carded woolen fabrics have been employed to a considerably larger extent than the worsted mills.

The clothing trade certainly did not do their usual volume of business. The explanation offered is that the people are economizing and making their clothing last another year.

Some duplicate business has been received for heavy weight fabrics and the advanced prices have been paid for them. There has been a demand for these fabrics below prevailing prices, but manufacturers are necessarily holding firm to their highest prices at which the orders will be placed or rejected. The demand for heavy suitings call for a large percentage of wide, indistinct stripes, which are much in favor.

In the history of the woolen business there probably has not been a time when so few stock goods were being carried as at the present time. They have been sold at good prices, which is another unusual thing. Buyers realized that goods made six months or longer ago were dyed up to the standard and could be relied upon to give satisfaction, while there is doubt regarding the colors of many new goods that will be offered.

The large dress goods mills, making many narrow cotton warp goods, are having a prosperous order business on account of the advanced prices being necessarily much less than for all worsted goods.

The demand for fall dress goods has continued in a moderate way and in the aggregate considerable business has been done during the month to meet the present requirements of the looms, and to keep them in motion until returns begin to come in from their spring goods samples, when offered for orders.

There has been considerable demand for goods for seaside uses and for tennis and automobile wear. Light colored chinchillas have been in good demand.

THE ITALIAN COTTON INDUSTRY SINCE THE EUROPEAN WAR

BY RAFFAELE SANSONE

The Italian cotton industry, despite the great assistance given by the Italian Government in placing a very high importation duty on all manufactured and treated goods, was already suffering very considerably several years before the European conflagration owing to the business depression prevailing all over the world. Of the 4,580,000 spindles installed in the different portions of the peninsula only four million were active, the remainder lying idle because of the shutting down of some of the mills, through spontaneous reductions introduced by the mills themselves, or through an arrangement made by the Instituto Cotoniero Italiano.

This condition of affairs, already very serious in itself, became still worse when the European war was declared, and it reached the highest pitch during the month of August, owing to the uncertainty and confusion in every branch of the trade, and to the fear of being immediately drawn into conflict. A very severe reduction in the production was the consequence, and the work in the majority of the Italian cotton mills was reduced to four days per week. The majority of these mills would not close, however, and those who were compelled to do so did it through other reasons than the war. This kept many employed that would have otherwise been thrown out of work. Moreover, as the families of those working in the majority of the Italian cotton districts were also engaged in agricultural pursuits, this short time schedule was not so severely felt, especially as it came when the working of the fields was necessary.

The favorable financial conditions, the improvement in credits, the open sea, and above all the prolonged neutrality, assisted greatly towards improving little by little the conditions of the Italian cotton industry. This was greatly assisted through a proper application of the decree prohibiting the exportation of cotton goods, that permitted the satisfying of urgent foreign needs, and through the military and naval authorities purchasing a great portion of the stocks, that for years had been accumulating and constituted a source of constant uneasiness to cotton manufacturers. All this increased little by little the work of the Italian spinning and weaving concerns and the prosperous times soon returned.

The quotations for raw cotton, which after the closing of the Liverpool and American markets had become very uncertain, encouraged certain American operatives to flood the market with exceeding low offers. This encouraged many Italian cotton merchants and spinning and weaving concerns to place very large orders for low priced cotton and if all these are filled their profits will be indeed very high.

Since the entering of Italy side by side with England and her Allies in the European conflict the conditions of the Italian cotton industry have not been altered in the least, in fact they have still improved, and this is not difficult to understand. The army and navy equipments being anything but complete, and consumption being large, the works are running overtime and cannot manage to satisfy all requests, so that the Italian Government is obliged to seek supplies abroad.

The labor employed in the Italian cotton industry has not been affected to any great extent by the war, for of the 120,000 hands employed in this industry three-quarters are women or girls, and the small number of men

called to arms has already been replaced by others.

One of the only real difficulties encountered at present, however, in the cotton industry is the lack of dyestuffs. Many dyers have to return to the old-fashioned and troublesome natural colors as those of artificial manufacture are becoming more scarce every day, and they are not to be purchased anywhere owing to the comparatively few works at present in a position to produce or export them.

The goods shipped to Germany and Austria was, before the entrance of Italy in the European war, quite insignificant, as the English warships and their forts stationed at Gibraltar and in the Suez Canal did not allow the passage of any cotton coming from the United States or any other part of the world, that was destined to these countries. At present their delivery has ceased altogether owing to a recent royal decree that forbids the exportation of all goods destined to the central empires.

Other interesting decrees have been issued referring to the same question. Thus on May 4, 1915, a special decree defined the right of seizing goods not claimed for in the port of Genoa as follows:

"All goods lying in the railway spaces or maritime docks of the port of Genoa must be withdrawn within ten days from the above date. If this does not take place the railway administration will have the right to send them in deposit at an interior station, advising those concerned and awaiting their further instructions.

"When there is no room in the port of Genoa, or for other reasons, the railway administration will have the right of detaining in certain stations all goods that may be thought necessary. If after three months the goods have not yet been claimed or withdrawn, they will be considered abandoned, and the railway administration, or the Consorzio Autonomo del Porto di Genoa, will have the right to sell them. The period of three months can be reduced when the goods are liable to be spoilt or for other reasons."

The sales decided by the above decree never took place and even at present no cotton is sold by the above authorities. The reason for this will be explained later.

Another very interesting and important decree was published on June 11 in the Italian Official Gazette, that established definitely a commission for the seizure of prizes, the result of which was the capture of several Austrian and German ships lying in port.

A certain quantity of cotton will undoubtedly be imported just the same to Germany or Austria by Switzerland, eluding the above vigilance and seizure system, and a rough idea of the extent to which a similar imporation can take place is to be gathered from the following statistics:

From May 4 to 19, 10,702 tons of raw cotton were entered in the port of Genoa, 7,697 tons being destined for the interior, and 3,005 tons for exportation, principally to Switzerland.

From May 28 to June 24, 22,690 tons of raw cotton were entered in the same port, 17,581 tons being destined for the interior and 4,109 tons for exportation, also principally to Switzerland.

Stocks of cotton, principally those in the port of Genoa, reached very high figures during the first months of the war, as the number of freight cars on hand for transporting the material destined to Italian manufacturers or merchants and to Switzerland, Germany and Austria was quite insufficient for keeping up with the arrivals.

The number of bales of raw cotton that entered this port during the month of August of last year reached 23,351, while in September, owing to the great panic and enormous delay in deliveries of all kinds, the imports were reduced to 6,244 bales. In October the number of the bales showed a considerable increase amounting to 32,119. Notable in this last month was the importation of raw cotton from Egypt which was ten times higher than in the two preceding months; August 654 bales, September 405 bales, and October 4,577 bales.

During the month of November the deliveries increased still further. Owing, however, to the lack of freight cars, mentioned above, the greater part of the raw

cotton could not be distributed, and during this month there was an accumulation of 60,000 bales. The Italian spinning and weaving concerns were thus deprived of their raw material and by the rapid decrease in the stocks saw themselves in danger of a general closing or lock-out. Some consider that the above lack of freight cars was purposely created for stopping, or at least reducing, deliveries across the frontier, especially owing to the probabiity of war with the central empires.

In December the quantity of the raw cotton that had to be stocked in the port of Genoa was 115,000 bales. This accumulation and overcrowding of stock especially as at the same time other goods came pouring in from every portion of the globe, was the cause of a fire that destroyed a certain quantity of the cotton. To avoid a repetition of a similar calamity, many of the cotton bales were stored in the open on the docks, and in many cases either found their way into the sea, or by remaining continually exposed to bad weather accumulated water and dirt, which resulted in mildew.

Owing to the removal of much of the cotton goods accumulated in the port of Genoa during the last months of 1914, the stocks in this port have been much reduced, remaining, however, constant at about 33,077 tons, the value of which is calculated to be 46,307,300 lire ($9,261,460).

The ships loaded with cotton that have to remain in port waiting to discharge cargo are never very numerous. On April 15 the ships waiting in port of Genoa and in the ports of Vado, Spezia, S. Markherita and Oneglia were four and contained between them about 11,000 tons of cotton having an approximate value of 13,000,000 lire ($2,600,000).

The above stocks appear to have remained constant to the last month. The greater portion of the goods arriving have since the reorganization of the railway traffic been entered and sent off at once. This stock represents the cotton available for sale and also represents to a certain extent that which has never been claimed and which in accordance with the royal decree of May 4 have simply been seized. Such goods are not, however, sold at auction, being kept in case the supply required for military purposes should be consumed.

GUN COTTON

BY LOUIS J. MATOS

Under the name Gun Cotton, is included a broad group of nitrated cottons that find extensive use in the arts of peace and war. For military and naval purposes, gun cotton is used in two general forms: one, as gun cotton proper, that is, pure nitrated cotton, while the other is in the form of "smokeless powder," a solid form of gun cotton, made by dissolving loose gun cotton in a suitable solvent, to form a jelly, which, when moulded into desired forms such as rods, "grains," etc., constitutes the modern explosive used in artillery and small arms. The manufacture of smokeless powder will not be described in this article.

Nitrated cotton for the peaceful arts is not strictly "gun cotton," but cotton nitrated to a lower degree of nitrogen content, thus permitting the finished product to dissolve in various solvents, such as amyl acetate, etc., and its mixtures with other fluids, as will best adapt it to the use intended. Such nitrated cottons are known as soluble cotton, pyroxylin, or collodion cotton, and the solution of such cotton as pyroxylin varnish, or zapon varnish. In both the leather and the "artificial leather," i. e. coated fabric industry, the solution of nitrated cotton in a solvent is termed "dope."

According to the uses to which these varnishes are put, the solvent is mixed so as to give the desired result according to the nature of the article varnished. It may be silver plated ware, bronze ornaments, brass work, leather of various kinds, textiles, etc., and the amount of work done by chemists and others along this line is immense, and when one has succeeded in obtaining a mixture that he regards as unique, it is jealously guarded as a real secret.

Manufacture of Gun Cotton. To render cotton explosive, requires that it should be treated with nitric acid under suitable conditions, so as to secure the maximum amount of nitration with the least expendi-

ture of acids, and in the shortest time. The operations from one stage to another require constant oversight, as the slightest carelessness may lead to the production of a cotton of little use for compounding explosives, or it may lead to frightful explosions. It must be remembered that when gun cotton explodes, the entire mass of it goes off at one time, that is, the entire quantity is almost instantaneously converted into gas, and not, as in the case of gun powder, the combustion of the charge of which is progressive.

The raw material preferably used in the manufacture of gun cotton is either clean raw cotton or carded cotton. Other forms of cotton may be used, such as cotton mill waste, but this has certain drawbacks, on account of the mechanical operations necessary to fit it for the chemical treatment.

The raw cotton is kier boiled for eight hours with soda to completely remove all traces of the natural impurities, the presence of which would retard the nitration, and consequently lead to the production of a cotton that would be below the standard nitrogen strength. Practice in the several plants differs somewhat as to the alkaline boil, but the general rule is to use about fifty pounds of soda per 1,000 pounds of raw cotton. The cotton as it comes from the soda boil must sink completely in cold water, in other words, it must be completely absorbent. Every care is taken to conserve the fiber. After the soda boil, the alkaline liquors are run off, and the cotton washed with water to neutral reaction, when it is whizzed and dried on wires, or passed through an apron drier preparatory to pickering.

Pickering is for the purpose of breaking up all lumps of matted cotton, which is then further dried so as to reduce the moisture content to half a per cent or less, this being the maximum amount that the clean cotton should contain when it is ready for nitration. From this second dyeing the cotton is quickly made up into approximately accurate batches of ten pounds each, and enclosed in cans provided with closely fitting covers, and in which it is allowed to cool to normal temperature, and without absorbing moisture from the atmosphere. In some gun cotton plants, lots of cotton as small as one pound are nitrated, but in the larger works, batches as large as thirty pounds are treated in each pot.

Nitration. This is done in two ways. Either the dry cotton is dipped in the acid for a given time, removed and allowed to drain and then digested; or, the cotton is first well packed in the nitrating apparatus, and the acid run on it and allowed to remain in contact for the proper time, then run off, and the washing of the cotton proceeded with in the same apparatus. In this case, the cotton is stationary while the acid moves; in the former, the cotton is moved through the acid.

The nitrating acid is a mixture of concentrated nitric acid and concentrated sulphuric acid, in the proportion of fifty parts of the former to one hundred and fifty parts of the latter. The nitric acid must have a specific gravity of 1.5; the sulphuric acid be not less than 1.845. In England, under the late Sir F. Abel, a mixture of fifty-five parts of nitric acid (Sp. Gr. 1.516) and one hundred and sixty-five parts of sulphuric acid (Sp. Gr. 1.842) is used for each one pound of cotton treated.

The nitrating vessels are charged with the cooled mixed acids, and into each one in turn, the proper amount of dry cotton is immersed, being kept down and under the surface of the acid by means of an iron or aluminum fork. The immersion lasts for a few minutes, when the cotton is lifted and allowed to drain only for a minute, when it is at once transferred to a "digesting pot" in which it is allowed to remain for twenty-four hours. These digesting pots are mounted in troughs containing cool water; this is to guard against the contents of the pots becoming heated during the digestion. The object of allowing the nitrated cotton to digest, is to ensure that all the cotton has received the fullest action of the acids, although the major part of the nitration has been accomplished in the "dipping." As a rule, the digestion pots are made of glazed stoneware, and contain about 2 to 2 1/2 gallons, although larger sizes are used. Before putting the nitrated cotton in them, the pots must be made perfectly "dry," which is done

by wiping them with a small quantity of strong acid. If any moisture is present, there is a strong chance of the contents becoming "fired." Crocks of the above size will contain about ten to twelve pounds of nitrated cotton. When each pot is full, the contents are squeezed down as much as possible, the cover put in place, and stood in the trough over night.

From the digestion pots, the cotton is removed and passed through the acid wringer, which is simply a whizzer. This removes the excess of acid, when the gun cotton is removed to the immersion tub where the remaining acid is washed out. In removing the cotton from the pots, no possible chance is to be given for water to come in contact with the cotton. The pots must be allowed to drain well on the outside after lifting from the trough. Drops of water in contact with the cotton saturated with strong acids may cause immediate overheating, and explosions are likely to occur.

The immersion tub is large, and may contain 1,000 gallons of cold water or more. The nitrated cotton from the acid whizzer is fed into it, little by little, so that the revolving paddle wheel that the tub has, will at once immerse each handful instantly, and this is kept up until all the cotton has been introduced from fifty crocks. If the cotton is fed in large quantities at a time, it will heat up and fire quicker than the water can drown it. The term "drown" expresses exactly the operation of immersion. While the cold water removes a very large amount of the acid from the cotton, there still remain traces of acids that can only be removed by subjecting it to a weak alkaline boil containing about half an ounce of soda ash per gallon of water. This boiling proceeds for eight hours, the cotton is then drained for several hours, when it is given two successive fresh water boils to ensure the complete removal of all the alkali.

Following the soda boils and washes, the final mechanical treatment of the cotton begins, and consists of pulping it in a machine of the rag engine type as used in a paper mill, which shreds the cotton to a fine state of division. This operation takes sometimes two days to do properly for a batch of five hundred pounds. From the beating engine, the cotton passes to a similar machine, termed a "poacher" and in which the final washing takes place. The poacher is provided with paddles that keep the cotton in suspension. From time to time, a sample is drawn and tested as to its fitness for use, and the mass is not removed until the last sample meets the requirements.

The final operations are simply those of draining and pressing Explosive cotton is usually kept in a moist state with about 15 per cent. of water, although when used in the military service, it may contain over 30 per cent., which is added by allowing the press blocks to stand in water for some time.

The principal point to attend to in the manufacture of gun cotton is the control of the strength of the mixed acids. This must be done with the greatest of care, and complete records made of the acids both before and after use. The spent acids are, in some instances, fortified with strong acids, and brought to the full working strength for new batches of fresh cotton.

The United States Government makes certain specifications for the nitro-cellulose to be used in the manufacture of its smokeless powder, and they may be summarized as follows: The wetting down in the "immersion tub"—the drowning above referred to—is to be followed with either steaming or boiling, and to be continued until methyl orange and phenolphthalein show the nitrocellulose to be free from acid and alkali. The pulping in the beater must be continued to a state of fineness satisfactory to the inspector. The boiling after pulping is to continue for six hours, the water to be changed at least twice. Washing after boiling shall be with either hot or cold water, or both until the nitrocellulose gives the specified heat tests and is shown to be free from alkali.

The several tests made use of in determining the quality of gun cotton are briefly described.

(1) Potassium iodide-starch test. The gun cotton must stand this test for a period of at least forty minutes at a temperature of 149.9° F. without showing a brown coloration.

(2) German 135° C. test. (275° F.) Blue

litmus paper must not be reddened in less than thirty minutes when exposed to the vapors from a sample of the gun cotton contained in a test tube.

(3) Moisture.

(4) Soluble nitrocellulose. The sample must not contain less than 98 per cent. of soluble cotton.

(5) The amount of unchanged cotton is determined.

(6) Ash. Not more than 1 per cent. of ash is allowable.

(7) Alkalies. If not more than 1.0 cc of N/10 acid be neutralized, the nitrocellulose will be considered free from alkali.

(8) Nitrogen. This is the most important test of all. From its result is ascertained the explosive value of the nitrocellulose. Nitrogen is determined by means of a standard nitrometer, an instrument of the greatest value in all explosive factories for determining the amount or nitrogen in either mixed acids or in gun cotton. The amount of nitrogen required in a sample is 12.65 per cent., with a leeway of 5 per cent. above or below.

The production of nitrated cottons for the manufacture of collodion, pyroxylin varnishes, celluloid, etc., constitutes a very large industry, and its scope is constantly widening. The main points of difference between it and the manufacture of gun cotton for explosives, is in the degree of nitration attempted, and in the preliminary treatment of the cotton. For most purposes, the cotton must be bleached so as to produce a nitrated cotton, that, when "colloided," will not be dark colored. Soluble cotton for varnishes of certain grades must be made with the greatest care from cotton of the choicest qualities.

Medium nitrated cottons ranging in their degree of nitrogen content from 10.9 per cent. to 12.3 per cent., have a dissolving power from 99 to 100 per cent. in a mixture of two parts ether and one part alcohol, called in the trade "ether-alcohol."

Pyroxylin or soluble cotton differs from gun cotton in that the latter is practically insoluble in ether-alcohol, and the former but slightly explosive. Collodion is an ether-alcohol solution of pyroxylin, and is sold under various names. It is used in this form as a dressing for wounds, and in photography for numerous purposes. For varnishes, pyroxylin is dissolved in numerous solvents, such as wood alcohol, acetone, methyl and amyl acetates, or mixtures of these, with or without benzine, which is sometimes added to cheapen the cost and to facilitate drying. Celluloid is a compound of camphor and soluble cotton, with or without pigments or other coloring matters according to the uses to which the compound is to be put.

The nitrocellulose industry is one of great importance, but in engaging in it, all the several details should be given very careful consideration, and the appliances necessary selected with the sole object of doing the work for which they are built.

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THE ENGLISH MARKET FOR TOPS AND WORSTED YARNS

By Our Regular Correspondent

It is, of course, freely understood that the conditions which have made feasible the export of American tops and worsted yarns to the English market are the extraordinary ones incidental to the state of war. As is sufficiently well-known, the production of wool has gone on without appreciable interruption. Over a large and important part of the Continent of Europe manufacture of wool has been stopped. In Great Britain the mills are theoretically free to proceed but in point of fact their progress is hampered by a stortage of male labor which makes it difficult to obtain supplies at the moment they are wanted. The interruption of continental work has thrown certain lines of business into British hands and with some of these orders British producers are more fully equipped to deal than with some others. The most conspicuous of the new demands has been for army cloth—woolen, worsted or half-woolen and half-worsted—requiring wools of the strong crossbred type. With these last English manufacturers have been particularly able to cope.

No statistics show exactly what is the

ratio of British combing and spinning machinery for crossbred in comparison with the comb and spindles built for merino, but it is no secret that the crossbred worsted business is by far the larger trade. The manufacturers of strong wools is the traditional Bradford business, upon which the trade is merino wools is a comparatively modern graft. Bradford so specialized in combing and spinning the longer and coarser wools that it was able, before the war, to supply immense quantities of crossbred and English yarn to Continental markets which were fully self-supplying in merino yarn. All the machinery which finds its normal outlet in spinning crossbred for export is available for making weaving and knitting yarns for the supply of the British and Allied forces. Some of it is adaptable also for merino if merino tops could be had, but merino combs are less plentiful than crossbred combs and hence it comes that the cry is not so much for new sources of crossbred tops as of merino tops.

The British worsted industry as a whole has specialized upon strong wools and the Continental mills upon fine ones. And although Continental production has diminished there is still a demand for the type of goods that French-German mills used to make and notably for wool dressgoods. The demand for the latter is bigger than English mills can meet with the resources at their disposal. For the time being, the dress business is the busy trade and it calls for counts of yarn from 48s up to 70s. Given the requisite tops Yorkshire spinners could probably spin the yarns in sufficient quantity and given the yarns at the right time Yorkshire looms could turn out more of the goods. Because delivery is so difficult in view of the contracts already booked and the limited number of the combs, prices have been rushed high and threaten to go higher. It had been expected that manufacturing facilities would go to a premium and that prices would rule for goods that bore no correspondence with the prices commanded by the raw wool but the expectations have been exceeded. On merino wool bought in May and sold as tops in June profits of 14 to 24 cents have been made by topmakers. Spinners keep their own counsel as to the amount of money that they are making and their profit is governed by the tendencies of purchasers of tops, but it is a fair supposition that their margin of profit is not much less than 24 cents a pound on the average "Botany" yarns—to give merinos the name by which they are most known in the Bradford trade—have practically doubled in price. Tops which cost 54 cents in December fetch 90 cents at the end of June.

Dressgoods are light in weight and trade in them may therefore survive these astonishing advances better than the business in heavier goods Orders for the 2/28s, 2/36s, etc., of the coating trade are the reverse of active. The verdict of manufacturers of men's goods is that there is no business waiting to be done at the existing levels. Thus in looking at the prospects allowance has to be made for some falling off of normal business as well as for the effects of exceptional demands for light fabrics. There is nothing like a guarantee of an indefinite expansion and as prices are far higher than anything ever attained in the past they cannot be other than perilous.

The material fact is that the rise in tops gives the American comber a chance to step in. Supposing him to hold wool at any of the prices obtaining earlier in the year, he has a margin to work upon sufficient to eclipse the excess cost of combing and to pay for freights and expenses. Supposing him to be able to guarantee delivery equal to an approved sample and within a useful time, there is business that can be done. It is well, however, to recognize that the English spinner is an exacting customer. The best Bradford spinners are content with very few makes of Bradford tops and confine their purchases to a comparatively small selection. As they are on guard against their neighbors still more may they be expected to be against strangers of whom they have not heard uniformly flattering accounts. Experience with American tops has been limited and the article has its real reputation to make. Meantime parties who may not be disinterested and who have at any rate no

ambition to see American tops in competition with their own, put about unfavorable suggestions. It may be instructive to record the character of some that have been heard:

"The Americans drive their combs too hard."

"Admitted that they do comb upon English machinery; but they add to the combs patents of their own."

"They don't understand blending."

"They mix their own wools with Australian."

"The climate is different and climatic conditions are enough to make all the difference between a satisfactory and an unsatisfactory top."

These warnings are not likely to deter spinners from forming and acting upon their own opinions. They are, of course, close judges of the character of tops and as well able as anybody to say whether a given sample is what they require. The more the sample resembles the makes they are accustomed to the nearer must be the prospects of business, since for new and distinct blends new purposes would have to be found. To cite simply one example: Some of the best-appreciated tops upon the market are made from straight parcels of Gesling wools. The fleeces, after being looked over, are broken to form two qualities, 70s and 64s,, and are sent to comb. Were the same practice followed with the same wools in America and the same proportion of noil extracted it is at all events probable that the result would be a top of a length, strength, firmness, color, bulkiness and handle that a good spinner could confidently use. The same could be said of other instances where Australian wools of high and uniform grade are converted without blending and business upon these lines is the likeliest to give satisfaction to all concerned.

The furnishing of a satisfactory article is the main matter and to this the subject of terms of payment is subsidiary. The regular terms in selling tops are cash in seven days less four months' discount. The discount is calculated at five per cent. per annum and is therefore 1 2/3 per cent., or, in English currency, fourpence in the sovereign. Above all in dealing with new supplies, spinners expect to buy upon a conditioning house certificate and their Bradford-combed tops are delivered to the local conditioning house before going on to the spinner. Samples are drawn by the officials and over-dried and payment is made upon the certified dry weight with 19 per cent. added for moisture. The regain named is for oil-combed tops; for dry-combed the allowance is 18 1/4 per cent. The spinner might also be expected to insist upon tests for oil and it may be useful to point out that 3 1/2 per cent. gross loss after absolute scouring is the regulation allowance for tops combed in oil and that a gross loss of .634 per cent. is the standard for tops combed dry. Some latitude is allowed in the thickness of slivers but for all tops of merino quality a size of 4 ounce per 10 yards is preferred. Purchasers might be expected to ask that deliveries should be tested for condition at the Bradford Conditioning House, at the end of a long voyage during which the shipment may have lost weight. English firms, in selling for export, are, however, accustomed to stipulate that the test shall be made at the beginning of their journey and probably they could not finally refuse to accept the certificate of a duly constituted American testing establishment.

Spinners are critical of tops because their customers, the weaving manufacturers, are almost hypercritical of yarn. Both the market value of yarn and the opportunities of continuous business are governed by the perfections with which yarn is "managed." The success of the result is dependent upon machines and materials but the finishing touches of satisfaction or its opposite are applied by the help and unless the workpeople are apt and attentive and kept closely up to their work not much profit is to be anticipated from any attempt to supply yarn to manufacturers of high-grade goods. The position of the latter as to yarns is the same as that of the best spinners as to tops. Few makers are good enough for them. They cannot afford to have difficulties with their customers about their woven goods and a standard has been set in the past which they have to maintain. The spinners with whom

they regularly deal know the particular character of their requirements and without this knowledge there is an eminent probability of difficulty because of the delivery of yarn not entirely suitable for the purpose to which it is to be applied. It is needless to labor the point that for goods to be woven in one way yarn may be satisfactory when it would not be so in other circumstances. Hard knocks have told the regular spinners which are the unsuitable purposes and this information the newcomer has to acquire for himself. The possible defects are not simply the obvious ones of irregularity of size or of twist or the too frequent appearance of vegetable fibers or of slubs. If the pieces mull up too far; if new-spun and old-spun yarns are mixed in the same delivery; or if any of a dozen different defects exhibit themselves after weaving and finishing and dyeing the maker of the goods is apt to conceive that he has a valid grievance against his spinner and to take measures accordingly. It is manifestly not impossible to satisfy the established standard of requirement but the work is not easy and nothing is gained by supposing that it is.

Business can be done in 1/60s on a basis of $1.36 per pound spun from shafty Australian merino of 64s nominal quality. Two fold 60s of nominal 70s quality sell at about $1.50. The quotations are for the regular terms of trade with 2 1/2 per cent. discount for credit of between one and two months. The allowance of credit varies in different sections, the Bradford habit being to pay for all yarns delivered in one month in a 14 days' bank draft drawn upon the second or third Thursday of the succeeding month. A useful alternative would be to offer 3 3/4 per cent. for prompt cash. Yarn is not so universally dealt in upon a conditioned basis as tops but it could not fail to increase confidence to offer to sell on the standard basis of 18 1/4 per cent. regain. The regular system of trading is to contract for a specified number of thousand weight and in existing conditions it would be natural to insist upon receiving delivery particulars down, although when business has to be sought urgently it is customary to contract for a quantity with particulars to follow at the convenience of the buyer. In those circumstances it is understood that two-thirds must be completed within six months and the balance within a further three months.

The suitability of American yarns for English purposes is disparaged by English yarn-sellers quite in the same way as the eligibility of American tops. The additional argument is used that English people can attend to the spinning if the Americans can furnish the tops and it is hardly disputable that English spinners do know more than Americans about the peculiarities of the English market. Whether American mills elect to send tops, yarn or pieces is their own affair. In any of the three cases they are likely to run against established predilections in favor of methods which are not necessarily the ones to which Americans are the most accustomed. In normal circumstances the preference is for the established way, be it English or Continental. New ways are all experimental and in the circumstances of the time no opinion as to how long the extraordinary conditions are likely to last which gives American industry its unexpected chance have more than a very limited value. Fancy values and profits are assuredly not destined to last forever and it is notorious that sudden rises lead to sudden falls. Whatever may be thought of the chances of a fall it is entirely prudent to limit the risks of loss from this cause both by exercising caution as to the concern to whom one sells and in restricting forward operations to a date not too far ahead. It is always the case that most difficulty is made over the supplies that have been bought dearest and in these times British spinners like to have their business well in hand.

The world's production of raw silk in 1912 amounted to 54,948,007 pounds, as compared with 37,595,425 pounds in 1900.

The total imports of American cotton into Havre in 1914 amounted to 132,267.4 tons, of which 132,201.9 tons were for consumption in France. The figures for the calendar year 1913 were 246,474.7 and 246,294.8 tons, respectively.

Correspondence and Notes

UPON TEXTILE TOPICS AT HOME AND ABROAD

THE RELATION BETWEEN PRODUCTION AND COSTS

By H. L. Gantt, Before the American Society of Mechanical Engineers

[While this paper deals more particularly with costs in machine shops, the principles discussed are equally applicable to cost finding in textile mills.]

Manufacturers in general recognize the vital importance of a knowledge of the cost of their product, yet but few of them have a cost system on which they are willing to rely under all conditions.

While it is possible to get quite accurately the amount of material and labor used directly in the production of an article, and several systems have been devised which accomplish this result, there does not yet seem to have been devised any system of distributing that portion of the expense known variously as indirect expense, burden or overhead, in such a manner as to make us have any real confidence that it has been done properly.

There are in common use several methods of distributing this expense. One is to distribute the total indirect expense, including interest, taxes, insurance, etc., according to the direct labor. Another is to distribute a portion of this expense according to direct labor, and a portion according to machine hours. Other methods distribute a certain amount of this expense on the material used, etc. Most of these methods contemplate the distribution of all of the indirect expense of the manufacturing plant, however much it may be, on the output produced, no matter how small it is.

If the factory is running at its full, or normal, capacity, this item of indirect expense per unit of product is usually small. If the factory is running at only a fraction of its capacity, say one-half, and turning out only one-half of its normal product, there is but little change in the total amount of this indirect expense, all of which must now be distributed over half as much product as previously, each unit of product thereby being obliged to bear approximately twice as much expense as previously.

When times are good, and there is plenty of business, this method of accounting indicates that our costs are low; but when times become bad and business is slack, it indicates high costs due to the increased proportion of burden each unit has to bear. During good times, when there is a demand for all the product we can make, it is usually sold at a high price and the element of cost is not such an important factor. When business is dull, however, we cannot get such a high price for our product, and the question of how low a price we can afford to sell the product at is of vital importance. Our cost systems, as generally operated at present, show under such conditions that our costs are high and, if business is very bad, they usually show us a cost far greater than the amount we can get for the goods. In other words, our present systems of cost accounting go to pieces when they are most needed. This being the case, many of us have felt for a long time that there was something radically wrong with the present theories on the subject.

As an illustration, I may cite a case which recently came to my attention. A man found that his cost on a certain article was 30 cents. When he found that he could buy it for 26 cents, he gave orders to stop manufacturing and to buy it, saying he did not understand how his competitor could sell at that price. He seemed to realize that there was a flaw somewhere, but he could not locate it. I then asked him what his expense consisted of. His reply was labor 10 cents, material 8 cents, and overhead 12 cents. My next question was: Are you running your factory at full capacity? and got the reply that he was running it at less than half its capacity, possibly at one-third. The next

question was: What would be the overhead on this article if your factory were running full? The reply was that it would be about 5 cents; hence the cost would be only 23 cents.

The possibility that his competitor was running his factory full suggested itself at once as an explanation.

The next question that suggested itself was how the 12 cents overhead, which was charged to this article, would be paid if the article was bought. The obvious answer was that it would have to be distributed over the product still being made, and would thereby increase its cost. In such a case it would probably be found that some other article was costing more than it could be bought for; and, if the same policy were pursued, the second article should be bought, which would cause the remaining product to bear a still higher expense rate.

If this policy were carried to its logical conclusion, the manufacturer would be buying everything before long, and be obliged to give up manufacturing entirely.

The illustration which I have cited is not an isolated case, but is representative of the problems before a large class of manufacturers, who believe that all of the expense, however large, must be carried by the output produced, however small.

This theory of expense distribution is quite widespread, and clearly indicates a policy, which in dull times would, if followed logically, put many of our manufacturers out of business. In 1897 the plant of which I was superintendent was put out of business by just this kind of logic. It never started up again.

Fortunately for the country, American people as a whole will finally discard theories which conflict with common sense; and, when their cost figures indicate an absurd conclusion, most of them will repudiate the figures. A cost system, however, which fails us when we need it most, is of but little value and it is imperative for us to devise a theory of costs that will not fail us.

Most of the cost systems in use, and the theories on which they are based, have been devised by accountants for the benefit of financiers, whose aim has been to criticise the factory and to make it responsible for all the shortcomings of the business. In this they have succeeded admirably, largely because the methods used are not so devised as to enable the superintendent to present his side of the case.

Our theory of cost keeping is that one of its prime functions is to enable the superintendent to know whether, or not, he is doing the work he is responsible for as economically as possible, which function is ignored in the majority of the cost systems now in general use. Many accountants, who make an attempt to show it, are so long in getting their figures in shape that they are practically worthless for the purpose intended, the possibility of using them having past.

In order to get a correct view of the subject we must look at the matter from a different and broader standpoint. The following illustration seems to put the subject in its true light:

Let us suppose that a manufacturer owns three identical plants, of an economical operating size, manufacturing the same article,—one located in Albany, one in Buffalo and one in Chicago,—and that they are all running at their normal capacity and managed equally well. The amount of indirect expense per unit of product would be substantially the same in each of these factories, as would be the total cost. Now suppose that business suddenly falls off to one-third of its previous amount and that the manufacturer shuts down the plants in Albany and Buffalo, and continues to run the one in Chicago exactly as it has been run before. The product from the Chicago plant would have the same cost that it previously had, but the expense of carrying two idle factories might be so great as to take all the profits out of the business; in other words, the profit made from the Chicago plant might be offset entirely by the loss made by the Albany and Buffalo plants.

If these plants, instead of being in different cities, were located in the same city, a similar condition might also exist in which

the expense of the two idle plants would be such a drain on the business that they would offset the profit made in the going plant.

Instead of considering these three factories to be in different parts of one city, they might be considered as being within the same yard, which would not change the conditions. Finally, we might consider that the walls between these factories were taken down and that the three factories were turned into one plant, the output of which had been reduced to one-third of its normal volume. Arguing as before it would be proper to charge to this product only one-third of the indirect expense charged when the factory was running full.

If the above argument is correct, we may state the following general principle:

The indirect expense chargeable to the output of a factory bears the same ratio to the indirect expense necessary to run the factory at normal capacity, as the output in question bears to the normal output of the factory.

This theory of expense distribution, which was forced upon us by the abrupt change in conditions brought on by the war, explains many things which were inexplicable under the older theory, and gives the manufacturer uniform costs as long as the methods of manufacture do not change.

Under this method of distributing expense there will be a certain amount of undistributed expense remaining whenever the factory runs below its normal capacity. A careful consideration of this item will show that it is not chargeable to the product made, but is a business expense incurred on account of our maintaining a certain portion of the factory idle, and chargeable to profit and loss. Many manufacturers have made money in a small plant, then built a large plant and lost money for years afterwards, without quite understanding how it happened. This method of figuring gives a clear explanation of that fact and warns us to do everything possible to increase the efficiency of the plant we have, rather than to increase its size.

This theory seems to give a satisfactory answer to all the questions of cost that I have been able to apply it to, and during the past few months I have laid it before a great many capable business men and accountants Some admitted that this viewpoint would produce a very radical change in their business policy, and are already preparing to carry out the new policy.

It explains clearly why some of our large combinations of manufacturing plants have not been as successful as was anticipated, and why the small, but newer plant, is able to compete successfully and make money, while the combinations are only just holding their own.

The idea so prevalent a few years ago, that in the industrial world money is the most powerful factor, and that if we only had enough money, nothing else would matter very much, is beginning to lose its force, for it is becoming clear that the size of a business is not so important as the policy by which it is directed. If we base our policy on the idea that the cost of an article can only legitimately include the expense necessarily incurred either directly or indirectly in producing it, we shall find that our costs are much lower than we thought, and that we can do many things which under the old method of figuring appeared suicidal.

The view of costs so largely held, namely, that the product of a factory, however small, must bear the total expense, however large, is responsible for much of the confusion about costs and hence leads to unsound business policies.

If we accept the view that the article produced shall bear only that portion of the indirect expense needed to produce it, our costs will not only become lower, but relatively far more constant, for the most variable factor in the cost of an article under the usual system of accounting has been the "overhead," which has varied almost inversely as the amount of the product. This item becomes substantially constant if the "overhead" is figured on the normal capacity of the plant.

Of course a method of accounting does not diminish the expense, but it may show

us where the expense properly belongs, and give us a more correct understanding of our business.

In our illustration of the three factories, the cost in the Chicago factory remained constant, but the expense of supporting the Buffalo and Albany factories in idleness was a charge against the business, and properly chargeable to profit and loss.

If we had loaded this expense on the product of the Chicago factory, the cost of the product would probably have been so great as to have prevented our selling it, and the total loss would have been greater still.

When the factories are distinctly separate, few people make such a mistake, but where a single factory is three times as large as is needed for the output, the error is frequently made, with results that are just as misleading.

As a matter of fact it seems that the attempt to make a product bear the expense of plant not needed for its production is one of the most serious defects in our industrial system today, and farther reaching than the differences between employers and employes.

The problem that faces us is then first to find just what plant, or part of a plant, is needed to produce a given output, and to determine the "overhead" expense on operating that plant or portion of a plant. This is primarily the work of the manufacturer, or engineer, and only secondarily that of the accountant, who must, as far as costs are concerned, be the servant of the superintendent.

In the past, in almost all cost systems the amount of "overhead" to be charged to the product, when it did not include all the "overhead," was more or less a matter of judgment. According to the theory now presented, it is not a matter of judgment, but can be determined with an accuracy depending upon the knowledge the manufacturer has of the business.

Following this line of thought it should be possible for a manufacturer to calculate just what plant and equipment he ought to have, and what the staff of officers and workmen should be to turn out a given profit.

If this can be correctly done, the exact cost of a product can be predicted. Such a problem cannot be solved by a cost accountant of the usual type, but is primarily a problem for an engineer, whose knowledge of materials and processes is essential for its solution.

Having made an attempt to solve a problem of this type, one of the most important functions we need a cost system to perform, is to keep the superintendent continually advised as to how nearly he is realizing the ideal set, and to point out where the shortcomings are.

Many of us are accustomed to this viewpoint when we are treating individual operations singly, but few have as yet made an attempt to consider that this idea might be applied to a plant as a whole, except when the processes of manufacture are simple and the products few in number. When, however, the processes become numerous or complicated, the necessity for such a check becomes more urgent, and the cost keeper who performs this function becomes an integral part of the manufacturing system, and acts for the superintendent, as an inspector, who keeps him advised at all times of the quality of his own work.

This conception of the duties of a cost keeper does not at all interfere with his supplying the financier with the information he needs, but insures that information shall be correct, for the cost keeper is continually making a comparison for the benefit of the superintendent, of what has been done with what should have been done. Costs are valuable only as comparisons, and comparisons are of little value unless we have a standard, which it is the function of the engineer to set.

Lack of reliable cost methods has, in the past, been responsible for much of the uncertainty so prevalent in our industrial policies; but with a definite and reliable cost method, which enables us to differentiate between what is lost in manufacturing and what is lost in business, it will usually become easy to define clearly the proper business policy.

"STRAIGHT LINE" TEXTILE CALCULATIONS

BY SAMUEL S. DALE

(This series of articles began in July, 1915)

SHRINKAGE AND GAIN

Changes in the quantity of textile material are calculated by percentage, that is by the number of units per 100 units of the original measurement. The yield is the quantity after the change has taken place. The percentage of loss, gain and yield is based on the original quantity.

If a lot of cotton weighed 200 pounds before picking, and 192 pounds after, the total loss is 8 pounds; the loss per 100 pounds is found by dividing 8 by 2 (hundred), which gives 4 pounds per hundred or a loss of 4 per cent.

The percentage of yield is found by dividing the total yield (192 pounds) by the original number of hundred pounds (2), which gives a yield of 96 pounds per 100 or 96 per cent.

The percentage of loss can be found by subtracting the yield per cent from 100. In the above example 100 — 96 = 4 per cent, loss.

The yield is also found in this way:

100—4 = 96 per cent., yield

If a lot of cloth measured 200 yards before and 205 yards after finishing, the total gain is 5 yards; the gain per 100 yards is found by dividing 5 by 2 (hundred), giving 2½ yards per 100 or a gain of 2½ per cent.

The yield per 100 yards is found by dividing the total yield (205 yards) by the original number of hundred pounds (2), giving 102½ per cent as the yield.

The percentage of gain is obtained by subtracting 100 from the yield per cent:

102½—100 = 2½ per cent., gain

The yield is also obtained as follows: 2½ (gain) + 100 = 102½ per cent, yield.

Ex. A batch of Bagdad wool weighed 381 pounds before and 288 pounds after scouring and dyeing. What is the percentage of loss and of yield?

288÷3.81=75.6 per cent., yield
100—75.6 = 24.4 per cent. loss, or:
381 (lbs.)—288 (lbs.)=93 lbs., loss
93 (lbs.)÷3.81=24.4 per cent., loss
100 (per cent.)—24.4 (per cent.) = 75.6 per cent.

Ex. A warp measuring 360 yards produced 336¼ yards of cloth from the loom. Find the yield and shrinkage in length, which includes take-up, thrums, etc.

336.25÷3.60=93.4 per cent., yield
100—93.4=6.6 per cent., shrinkage, or:
360—336¼=23¾ yards, shrinkage
23¾÷3.60 =6.6 per cent., shrinkage
100—6.6÷93.4 per cent., yield

Ex. The same lot of goods measuring 336¼ yards from the loom, measured 353 yards finished. From this finished length 6¾ yards of remnants were cut. What was the per cent. of gain in length and what proportion was put into remnants?

353 ÷3.3625=105 per cent., yield
105— 100=5 per cent., gain
6.75÷3.3625=2 per cent., remnants

Ex. Fifty pieces of kersey cloth measured 1875 yards from the loom and weighed 22.8 ounces per yard. When finished the same pieces measured 1439 yards and weighed 24.2 ounces per yard. Find the shrinkage in length and the loss in weight.

1,439÷ 18.75=76.7 per cent., yield in length
100— 76.7 =23.3 per cent., shrinkage in length
1,875× 22.8 =42,750 ounces, loom weight
1,439× 24.2=34,824 ounces, finished weight
34,824÷427.5 =81.4 per cent., yield in weight
100— 81.4 =18.6 per cent., loss in weight

Ex. A piece of cloth weighed 81½ pounds as it came from the extractor and 62 pounds when dried. Find how many pounds of water per 100 pounds of dry cloth were in the piece before drying.

81½—62=19½ pounds water
19.5÷.62=31.4 pounds water per 100 pounds of dry cloth.

This and the next problem differs from those preceding in that the loss is calculated on the final instead of the first weight.

Ex. A batch of cloth weighed 203 pounds as it was taken from the jigger and 60 pounds when dry. Find how many pounds of dye liquor per 100 pounds of dry cloth were in the lot when it was taken from the vat.

203—60=143 pounds dye in the lot.
143÷.60=238.3 pounds dye per 100 pounds of dry cloth.

ORIGINAL QUANTITY FROM YIELD AND SHRINKAGE

It is sometimes necessary to calculate the original quantity from the percentage of loss and the quantity obtained after the loss.

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Ex. Find the grease weight of a lot of scoured wool that weighed 360 pounds after a shrinkage of 20 per cent.

A pound of grease wool yields .80 pound scoured. It follows that the number of pounds of grease wool required to yield 360 pounds scoured is:

$$360 \div .80 = 450 \text{ pounds in grease.}$$

LOSS IN MANUFACTURING

It is often necessary to determine the total loss from raw material to the finished product. The method is similar to that already explained and is illustrated by the following example of the total invisible loss in manufacturing woolen goods. The figures are taken from actual practice covering the operations of a 12-set mill for 46 months on all wool fancy cassimeres and cheviots. At the beginning of the test there was but 1000 pounds of old yarn in the mill. This was afterward used for selvage. During the 46 months a small quantity of yarn was purchased and, as will be seen, served to balance the waste and yarn on hand at the end of the period named. The waste of the mill was used again in the batches. Very little was sold.

The weight of the goods is taken from the mill records. The conditions were so favorable that the following statement of the test will be of interest as showing the actual invisible loss in manufacturing territory wool into carded woolen cloth, as well as explaining the practical methods of calculating losses in manufacturing. The wool consists largely of territory, fully 80 per cent being that kind; the remainder was Georgia and Bagdad.

New stock delivered to the pickers; this includes no waste from previous batches:		
Wool scoured and colored	1,087,616	lbs.
Camel hair noils	600	"
Waste (bought)	29,370	"
Total new stock picked	1,117,586	"
Yarn on hand January 1, 1887	1,000	"
Yarn bought	28,650	"
Total new material delivered to mill	1,148,236	"
Stock sold	947 lbs.	
Material in process Oct. 31, 1890	46,213 "	47,160 "
Stock consumed		1,101,076 "
Cloth finished (including cotton on hand Oct. 31, 1890)		868,548 "
Invisible loss, 21.12 per cent		232,528 "

This test covered so long a period, nearly four years, and included so large a quantity of stock, considerably over one million pounds, as to eliminate many sources of error that are inherent in the test of a small quantity of material. The indicated loss, 21.12 per cent, may therefore be accepted as the average invisible loss in manufacturing scoured and colored territory wool into cloth by the carded woolen system.

Scarcely less interesting is a test in the same mill covering the first twenty-two months of the forty-six to determine the percentage of unfinished woven flannel obtained from new stock delivered to the cards. The results of this test are as follows:

New stock delivered to mill from January 1, 1887 to October 31, 1888. The waste from previous batches was used again, but is not included in the following statement:		
Fine territory wool	277,652	lbs.
Coarse wool, Georgia and Bagdad	115,275	"
Waste	5,171	"
Yarn on hand Jan. 1, 1887	1,000	"
Yarn bought	10,616	"
	409,714	"
On hand Oct. 31, 1888:		
Yarn	10,827 lbs.	
Waste	8,286 "	
Picked stock	9,220 "	
	28,333	"
Stock consumed	381,381	"
Flannel woven in 22 months	359,816	"
Invisible loss from picker to loom, 5.7 per cent	21.565	"

SHRINKAGE AND GAIN IN FINISHING

Both the length and total weight of cloth may be increased or decreased in finishing.

Nearly all grades of woolen cloth lose in weight because of the presence of oil, grease and dirt in the fiber, which are removed by the scouring process. Woolen goods are rarely weighted. Cotton goods are frequently weighted so that the goods weigh more when finished than when woven.

The length of fulled woolens is usually decreased by finishing. This is also the case with some woolen fabrics which shrink in length by finishing even when not fulled. Cotton goods, including cotton warp woolens and worsteds, ordinarily gain in length during finishing.

Changes of length or weight during the finishing process are usually expressed as so much per hundred units of the woven length or weight.

If a piece measures 100 yards when woven and 99 yards when finished, it is said to have shrunk 1 yard per 100 yards of the woven length, or 1 per cent. If the same piece measured 101 yards when finished, the gain is 1 yard per 100 yards of the woven length, or 1 per cent.

If a piece weighs 100 pounds when taken from the loom and 99 pounds when finished, the loss is 1 pound per 100 pounds of the woven weight, or 1 per cent. If the piece is weighted to make it weigh 101 pounds when finished, the gain in weight is 1 pound per 100 pounds of the woven weight, or 1 per cent.

If the raw material and process of manufacture are uniform, as they should be, the change of either length or weight should vary very little in different pieces of the same fabric. Woven fabrics, with the exception of silk, are usually sold as weighing so much per yard, or measuring so many yards per pound. The cost per yard, handle and value of the fabric depend largely upon the weight per yard and consequently this relative weight must be carefully regulated.

A loss of weight or an increase in the length tends to make the finished weight less than the woven weight per yard. On the other hand a gain in weight or a decrease in length tends to make the finished weight greater than the woven weight per yard.

Suppose that a cut of cloth measures 100 yards and weighs 100 pounds or 16 ounces per yard. If this cloth loses 10 per cent in weight in finishing without change in length, it is evident that the finished weight per yard will likewise be 10 per cent less, or 14.4 ounces. If the total weight of the cut is increased, say 10 per cent, without change of length, the finished weight per yard will be increased in the same proportion, or to 17.6 ounces.

From this we derive the following:

A change in the total weight of the cut changes the weight per yard in direct proportion.

Suppose on the other hand that the weight of a cut 100 yards long remains unchanged while shrinking 10 per cent in length to 90 yards in finishing. Then:

Woven weight per yard=total weight÷100
Finished weight per yard=total weight÷ 90

It follows that:

The woven and finished weights per yard are in reverse proportion to the woven and finished lengths. When both length and weight are changed in finishing, the weight per finished yard is the result of two changes, one in length, the other in weight.

Ex. Find shrinkage in length and weight of a cut; woven, 40 yards, 17 ounces per yard; finished, 37 yards, 15 ounces per yard.

40 (yards) × 17 (ounces) = 680 ounces, woven weight.

37 (yards) × 15 (ounces) = 555 ounces, finished weight.

37 (yards)÷40 (yards)=92½ per cent, yield in length.

100 per cent—92½ per cent=7½ per cent, shrinkage in length.

555 (ounces)÷680 (ounces)=81.6 per cent, yield in weight.

100 per cent—81.6 per cent=19.4 per cent, loss in weight.

The preceding operations may be expressed as follows:

a=woven yards; W=ounces per woven yard
c=finished yards; w=ounces per finished yard
s=yield per cent in weight; r=yield per cent in length.

1: c÷a=r, yield in length.

2: (c×w)÷(a×W)=s, yield in weight.
3: (r×w)÷W=s, yield in weight.
(r×w)=s×W.
4: (r×w)÷s=W
5: (s×W)÷r=w
6: (s×W)÷w=r
7: (a×W×s)÷w=c

The yield in weight is equal to the product of the finished ounces and percentage of yield in length, divided by the woven ounces.

Applying this method to the preceding example we have:

92½ (per cent yield in length)×15 (ozs. finished) ÷17 (ozs. woven)=81.6 per cent, yield in weight.

This form of calculation will be found useful for determining the yield in weight of a number of cuts for each of which the yield in length, woven and finished yards and ounces per yard are known.

Ex. A cut is woven 40 yards, 17 ounces; finished 42 yards, 13 ounces. Find yield in length and weight.
42÷40=105 per cent yield in length.
(1.05×13)÷17 (ounces)=80.3 per cent, yield in weight.

The following examples illustrates the operations given above, the numbers in brackets referring to the formulas:

Woven weight per yard:

Ex. A cloth yields 90 per cent in length, 80 per cent in weight, and weighs 24 ounces per finished yard. Find ounces per yard woven.
(4) (90×24)÷80=27 ozs. woven.

Finished weight per yard:

Ex. A cloth yields 90 per cent in length, 80 per cent in weight, and weighs 27 ounces per woven yard. Find ounces per finished yard.
(5) (80×27)÷90=24 ozs. finished.

Yield in length:

Ex. A cut of cloth measured 50 yards when woven and 46 yards when finished. Find yield in length.
(1) 46÷50=.92, yield in length.

Ex. A cloth yields 80 per cent in weight and weighs 27 ounces per woven yard and 24 ounces per finished yard. Find yield in length.
(6) (.80×27)÷24=90 per cent, yield in length.

Yield in weight:

Ex. A cut of cloth as it came from the loom measured 40 yards and weighed 27 ounces per yard. When finished the same cut measured 36 yards and weighed 24 ounces per yard. Find the yield in weight.
(2) (36×24)÷(40×27)=80 per cent, yield in weight.

Ex. A cloth yields 90 per cent in length and weighs 27 ounces per woven yard and 24 ounces per finished yard. Find yield in weight.
(3) (90×24)÷27=80 per cent, yield in weight.

In the finishing process the woven length and weight and yield of weight are usually known, the problem being to find

Finished length required for a given finished weight, or

Finished weight resulting from a given finished length.

Ex. A cut of woolen cloth is woven 40 yards long and weighs 27 ounces per yard. The yield in weight is 80 per cent. Find finished length required for 24 ounces per finished yard.

(7) 40×27=1080, ounces woven.
1080×.80=864, ounces finished.
864÷24=36 yards finished.

Ex. A cut of woolen cloth is woven 40 yards long and 27 ounces per yard. The yield in weight is 80 per cent. Find finished weight if piece measures 36 yards when finished.

40×27= 1080 ounces woven
100—80=20 per cent, loss in weight = 216 ounces

Finished weight 864 ounces

864÷36=24 ounces per finished yard.

This problem is solved by the preceding formulas as follows:

(1) 36÷40=90 per cent, yield in length
(5) (27×.80)÷.90 (yield in length)=24 ounces per finished yard.

COST, SHRINKAGE AND GAIN

At nearly every stage of textile manufacturing a change in the weight or length changes the average cost of the material in process. The cost of an article per unit of weight or measure after it has undergone a loss or gain is calculated by dividing the original cost of 100 units by the yield per 100.

If, for example, a lot of grease wool costs 14 cents per pound and loses 65 per cent in scouring, 100 pounds costing $14, will yield 35 pounds clean, the cost being:

$14.÷35=40 cents.

If the scoured cost is 40 cents with a yield of 35 per cent, the cost of 1 pound of grease wool is:

40×.35; 14 cents per pound in grease.

The cost as here understood covers only the first cost, and not any of the labor or other expense of the process in which the loss or gain occurs.

From the above explanation we have:

First cost ÷ yield per cent = cost after change.

Cost after change × yield per cent = first cost.

Ex. Yarn that cost 66 cents per pound gained 10 per cent in a damp storeroom. Find cost after gain.

100+ 10=110 per cent, yield

66÷1.10= 60 cents per pound cost after gain of moisture.

Ex. Wool that cost 18 cents per pound shrinks 40 per cent in scouring. Find cost per scoured pound.

100— 40=60 per cent, yield.

18÷.60=30 cents per pound scoured.

30×.60=18 cents per pound in grease.

Ex. A lot of yarn costing 72 cents per pound gained 3 per cent in dyeing. Find cost per pound of dyed yarn.

.72÷1.03=69.9 cents per pound.

The total cost including both cost of material and cost of scouring or other processes, is found by adding the various items of cost per pound together and then proceeding as already explained.

Ex. The cost for dyeing the yarn in the previous example was 7 cents per pound of the original weight. Find the total cost per pound of dyed yarn.

(72+7)÷1.03=76.7 cents per pound.

Ex. A lot of wool costs 14 cents per pound in the grease and shrinks 65 per cent in scouring and carbonizing. The scouring costs 25 cents per hundred pounds, grease weight. The carbonizing cost 1 cent per pound carbonized weight. Find the total cost per pound carbonized.

Cost of grease wool per pound	$.14
Cost of scouring	.00¼
	.14¼
Cost per 100 pounds in grease @ .14¼=$14.25	
Cost per pound clean (14¼÷35)	$.407
Cost of carbonizing	.01
Total cost per pound carbonized	.417

The cost of the wool may also be increased during the sorting process by loss of weight and by the separation of inferior sorts which are of less than the average value. The following example will illustrate the method of calculation:

Ex. A lot of grease wool weighing 1000 pounds cost 15 cents per pound, and after sorting yielded 11 pounds of clippings worth 3 cents per pound, 15 pounds of strings worth 2 cents per pound, 150 pounds of low sorts worth 8 cents per pound, and 802 pounds of sorted wool. The cost of sorting was 40 cents per pound. Find the cost per pound of the sorted wool.

First cost 1000 pounds @ 15 cents		$150.00
11 pounds clippings @ 3 cents	$ .33	
15 pounds strings @ 2 cents	.30	
150 pounds low sort @ 8 cents	12.00	
		12.63
Cost of 802 pounds of sorted wool		$137.37

Cost per pound, 17.1 cents.

(To be continued.)

WHY WORRY ABOUT DYESTUFFS?

From the Providence, R. I., Journal

At this crisis in the dyestuffs industry it should be particularly interesting to learn that a Southern experimenter has discovered, or invented, a way to color cotton in the plant.

If the report is to be believed he can grow red, brown, yellow and black cotton already, and, with such immediate results in primary colorings, progress in the production of delicate shades may be expected. Has not Luther Burbank, with his other strange experiments on floral and vegetable life, accomplished something of the kind? Pinks that are not pink, and roses that are not rose-colored, are common enough, and we have heard somewhere of green violets and indigo blue apple bossoms.

Is there any way to achieve these results with wool? Is so, our textile manufacturers would be practically independent of the dyers. Besides, a flock of purple, green, red and yellow sheep, with the common black

and white ones, would be highly decorative to the landscape and contribute to the eye-filling joys of nature.

The Kansas City (Mo.) Times announces that General W. G. Sharpe has discovered a new color which is superior to khaki and even surpasses the famous German gray which makes a body of German troops look like a mist in the distance.

The new color is obtained without dye at all. A cloth is woven from a mixture of the fleece of the natural white and black sheep so proportioned that it has a brownish gray hue. It is not at all like the khaki olive drab, but army officers say that it is the best "invisible" cloth ever made. An army dressed in it would be so inconspicuous a short distance away that it would be merged into the landscape. The new cloth will be a third cheaper than the khaki, and may be wholly manufactured in this country.

A TEXTILE TESTING HOUSE AT PHILADELPHIA

Philadelphia is the first American textile center extensively interested in cotton and wool, to take the initial steps necessary for the introduction of a standard sales contract for yarns.

A group of progressive men representing large interests have initiated a movement to provide a public textile testing bureau or conditioning house which will take place at the command of all branches of the textile industry in the Philadelphia district the means for the determination by a neutral and disinterested organization, of those things which should be a part of a standard sales contract such as net weight, allowable percentage of moisture, count at standard moisture, twist, strength, elasticity, length of staple, oil, etc.

At the fiftieth annual meeting of the National Association of Wool Manufacturers, a special conditioning house committee reported (Textile World Record, Feb., 1915, p. 74) the conclusion:

"that a 15 per cent. regain is the proper basis for the buying and selling of tops, and that in the absence of public conditioning houses the establishment of a condition basis for yarns is not advisable."

No doubt this report has been one of the factors which determined the Philadelphia textile interests to undertake the establishment of a conditioning house.

The special committee having the matter in charge consists of Harry C. Aberle, H. C. Aberle & Co., Chairman; Jos. Haines, Jr., Haines Hosiery Mill, H. S. Hicks, Alfred Wolstenholme & Son, Inc., A. W. Newman, Notaseme Hosiery Co. and Mitchell Stead, of Folwell Bros. & Co., Inc.

This committee has completed an agreement with the United States Conditioning and Testing Co. a cooperative corporation of silk, cotton and wool men having for its object the operation of textile testing laboratories for the benefit of American textile interests, by which the company will undertake to establish and maintain a conditioning house in Philadelphia.

To provide the funds with which to equip the house Philadelphia is to subscribe in small amounts to the stock of the company. This is not in the nature of a contribution, but is an investment, because the company is now operating successfully two conditioning houses, one in New York and one in Paterson, N. J., and pays a small semi-annual dividend.

The subscriptions are being received by the secretary's office of the National Association of Hosiery and Underwear Manufacturers and, although the undertaking has only begun, a substantial amount has already been subscribed.

KAPOK

This product is getting to be quite a factor in the East India trade. Java exported in 1914 nearly 100,000 bales of kapok weighing 40 kilos (88) pounds). This was 4,000 bales more than in 1913. Most of this goes direct to Holland and from there it is distributed, a considerable portion going to Germany.

The total imports of foreign and colonial sheep's and lambs' wool into the United Kingdom amounted during the year to only 711,600,000 pounds as compared with 800,500,000 pounds in 1913, or an average import of 799,800,000 pounds for the four preceding years.

ENGLISH NOTES

By Our Regular English Correspondent

A hitch that has occurred in manufacturing official French blue cloth has proved unpleasant for a great many English worsted manufacturers, both large and small. The question of quality does not arise and there is no suggestion of such tampering with the official specifications as was alleged in the American case. It seems that a West End manufacturer of raincoats, seeing some reason to think that he might receive French contracts for army cloth, gave out orders to manufacture lavishly. The makers had the impression that a contract signed by M. Millerand was in hand but the fact seems to be that his signature was missing, although some military officers had signed. Accordingly the cloth cannot be delivered and the financial arrangements of several mills have been seriously disturbed. There are two reasons for anticipating a safe issue from the trouble. The speculator is a man of substance and the cloth stands at a materially lower cost than the price of the day. The presence of this surplus supply, manufactured in the main by the best makers and from the best yarns, of course affects the opportunities of obtaining further orders for similar cloth from the French Government. An impression gains strength that the British Government has enough khaki on hand to see the campaign through the winter and that no considerable new quantities will be bought this year. Weaving manufacturers holding the benefit of contracts for cheap yarn have received orders which clear these old contracts out but the official stores are full of cloth and the pressure upon the clothing manufacturers is over.

* * *

This war is enough to affect the value of money all over the world and the last of its financial results has still to be seen. The recent issue by the British Government of an unlimited loan at 4 1/2 per cent. raises the value of money in England to something more like the American level. Cotton mills have been accustomed to receive call money from local depositors by offering this rate of interest. Industrial concerns generally have paid from 4 to 4 1/2 per cent. upon as much of their capital as was secured upon first mortgage bonds. The ability to obtain Government security for the same return implies in the first place a fall in the capital value of textile investments and it means higher interest for further industrial issues. Manufacturers wanting money from the banks have been able to get it in normal times at some rate between four and five per cent. Now they are asked somewhere between six and seven, although it cannot be said how long this stiff rate will hold. The difference is important enough in international competition when viewed in relation to its effect upon prices at large. Meanwhile, gilt-edged 4 1/2 per cent. stock is regarded as good value for their own money by mills with surplus funds for investment and substantial amounts of war loan have been subscribed for by the wealthier concerns and by the textile labor unions.

* * *

British dyers feel themselves worst off at present for colors like bright blue, violet and scarlet. The price of the limited quantities obtainable may be indicated by an offer to sell a little of a wool scarlet normally costing 14 cents at $2.64 per pound. With the aid of fustic, brown dyeing can be had in unlimited quantity; there is no trouble in getting fairly satisfactory coal tar blacks and the logwood blues can be had freely. Dyers have contracted ahead for such supplies as could be got but are far from an easy position. Their Swiss supplies have been menaced by the refusal of the German dyeware firms to supply color to Switzerland so long as Swiss color makers supply color to England. Since the beginning of the war Swiss color works have had their supplies of German raw and intermediate materials cut off and their consignments to England have been made in exchange for intermediate materials sent for manufacture.

British Dyes Limited has transferred its headquarters from Manchester to London and is searching for a site for the large plant that has still to be constructed. Shares to the value of three and one-quarter million

dollars have been subscribed by one thousand members of the consuming trades and it is the case at any rate with some dyers, that the purchase money is being found more easily than had been expected. Profit conditions change rapidly in the commission trades but there can be no mistake that the immunity from claims that has been established by the difficulty of getting dyestuff has played into the dyers' pocket.

* * *

A certain number of mill mechanics have joined the Munition Volunteers—Lloyd George's new corps of turners and fitters who engage to go to any munition works where their services may be required and to do all that is demanded of them. Mill repair departments also have lost a number of their machine tools which have been transferred to the shell-making depots that are being started in most industrial centers. The machines have been lent freely in some instances and in others have been sold at materially higher prices than the original cost. There is an insatiable demand for lathes and it is not easy to see how the tools can be replaced by British makers within a year. When the war is safely over it is probable that second-hand machine tools will go extraordinarily cheap. Meantime repair work may get itself done as best it can and manufacturers expect that their convenience will be left to suffer.

No extensions of mill premises are made except such as are imperatively forced. The cost of timber, which so largely comes from the Baltic, and of glass, which used to come from Belgium, and of steel, which is all wanted for other purposes makes building excessively dear. Indeed building of every kind is next to a standstill.

* * *

Less has been heard lately about the capture of German trade in the home and neutral markets and the circumstances are altogether unfavorable to the changes that would enable British mills to copy German methods of work. In consequence, displays of German samples for the instruction of British manufacturers have a very restricted utility. Where German goods are being replaced it is by the substitution of fabrics of a different type and even the promoters of sample exhibitions have to confess that their value is rather general than particular. A series of German samples analyzed at the Bradford Technical College and exhibited under the auspices of the Textile Institute have been at least in one sense well-chosen, inasmuch as they were of goods that have sold well. The goods have been described as worsted although the character of many of them could more accurately be called woolen. The more important were costume cloths made with a French-system worsted warp running as fine in extreme cases as 2/120s, Bradford count, and with a filling of heavier woolen noil yarn. The samples afforded ground for various discourses upon the amount of ingenuity shown in making effective use of cheap forms of raw material. The observations under that head lasted long enough to preclude a good many manufacturers from examining the goods that the lecturers were talking about and the admiration came principally from textile school teachers. From the informal comments of various manufacturers it was to be judged that several of them would be sorry to be turning similar goods out of their own mills. Upon all points of the kind opinions must vary and it is entirely natural on the part of the theoreticians to admire ingenuity for its own sake. Judging by other standards, maufacturers, who of course are never free from the suspicion of prejudice and conservatism, are inclined to regard as misdirected some of the efforts that professional circles most admire. The difference between the points of view is not a new one and there is no sign of its ceasing to exist.

* * *

Certain newspapers continue to make a daily grievance of the fact that Britain has not declared raw cotton contraband of war, ignoring the official reply that the step is unnecessary in view of the measures taken to prevent cotton cargoes from arriving at a hostile destination. This political flame is fanned by a group of scientists but the grievance has not developed into a large conflagration as yet. The scientists have

pledged their reputation that cotton rags could not be used to make explosives, but as the German authorities have lately taken over all stocks of that article it is to be assumed that they are of a contrary opinion. Apparently there is nothing more than suspicion to suggest that German cartridges are being filled with powder made from imported cotton yarn, but this idea may have something to do with the more rigorous restrictions that have been laid on the export of English cotton yarns to European countries. A German military decree forbidding the manufacture of cotton piece goods from yarns coarser than 16s English is not inconsistent with a possibility that coarse yarns are used for more pressing and destructive purposes. Some stories brought by neutrals have told of the replacement of cotton by wood-pulp in the German nitro-cellulose explosive factories. The accounts cannot be verified and there is evidence that even at heavy prices cotton is preferred.

The imperative need for increasing the total of British export transactions is gaining recognition and the notion of taking emergency measures begins to be discussed. The estimated direct cost of the war is five million dollars yearly and apart from this is the adverse trade balance, which is going against us at the rate of well over one thousand million dollars a year. The excess of exports is caused in part, of course, by the importation of war material and there can be no question of checking that movement by an import tariff. The uses of tariffs in helping to square national accounts are being mooted and may yet come to be tried. It is arguable that it would pay the country to levy taxes upon imports and give bonuses upon exports, distasteful as either expedient would be to free traders.

Some idea of the reactions of war on the trade in textiles can be got from the British trade returns for the first half of the year. In the corresponding half of 1914 imports of yarns and fabrics into this country were one hundred twenty-five million dollars and this time they are seventy-six million. Exports under the same classifications amounted to four hundred fifty-four million dollars during last year as against two hundred sixty-six million dollars in this. The excess of imports gains no assistance from the introduction of foreign yarns and fabrics, although it obtains some from the reduction of textile exports—normally the chief item in export trading. This reduction, although owing something to purely British conditions, owes far more to the disabilities under which the consuming markets are placed. Prohibitions laid upon the export of particular articles have their effect upon the total and influence also the business done with America.

Neither in the foregoing statement nor in that which follows are transactions in raw textile material taken into account. But as this is a half-year's end it may be pointed out that in January-June, 1914, some 77 1/4 million pounds of British, colonial and foreign wool were shipped from England to the United States. On this occasion the amount is 46 1/2 million pounds and as the total of wool exported was 70 million pounds it is clear that little went elsewhere than to the United States.

A measure of uniformity is to be traced in the decreases occurring in the principal lines in the table below. The falls are substantial ones of 25 to 50 per cent. and it is notable that in the midst of them exports of carpets should even have increased.

Exports United Kingdom to U. S.
Six months ended 30 June.

		1914	1915
Cotton yarn	lbs.	3,166,400	2,994,000
Cotton piece goods	yds.	32,168,600	24,062,100
Worsted yarn	lbs.	1,122,200	409,200
Woolen tissues	yds.	4,241,400	2,087,100
Worsteds and stuffs	yds.	16,848,600	10,818,000
Carpets	sq. yds.	224,700	237,200
Spun silk yarn	lbs.	388,448	293,909
All-silk broadstuffs	yds.	121,505	70,826
Mixed silk broadstuffs	yds.	730,923	332,430
Jute yarn	lbs.	1,083,600	69,500
Jute piece goods	yds.	34,731,100	24,016,000
Linen yarn	lbs.	1,456,500	844,700
Linen piece goods	yds.	63,292,800	40,343,600

The exportation to the United States from Bradford of woolen cloths (worsteds and woolens) and of woolen dress goods fell off in January, amounting to $181,731 and $236,278, respectively, as compared with $238,888 and $404,068 in December last.

SHEARING WOOL GOODS

By A Practical Finisher

There has been little improvement for some years in the machinery for shearing the loose fibers from the surface of woolen and worsted cloths, the present system of helical cutters working against a fixed blade being the most practical device so far invented. Many modifications of the bed have been brought out with the idea of bringing the fabric into closer contact with the cutting parts, and at the same time guarding against knot holes or damage caused by slubs or thick places. The prevention of holes has, however, been accomplished by rendering the cut less clean and short.

The usual length of cutters and blade is 66 inches, and the greatest of care is required to keep both in good cutting contact throughout the whole length without some parts being closer than others. It is usual after grinding a machine to test the whole length of blade and cutters with a slip of tissue paper, turning the cutters by hand. If properly adjusted the paper should be cut clean under any part of the cutters. By screwing down the spirals hard upon the blade, the tissue paper can be cut anywhere throughout the whole length, but this frequently means undue pressure and friction at places, with a rapid wear of the cutting parts and need for frequent regrinding. A careful grinder can keep his machines in order with half the grinding some have to resort to, as careful adjustment means equal wear of both blade and spirals, with less wear of the blade edge. For close shearing the fabric must travel as close to the cutting edge of the blade as possible, and this means a bed for the cloth which is exactly true and solid enough not to bend under pressure of the cloth or any of the set screws. It will be noticed by Fig. 1, that the best method of obtaining a close shear is to present the cloth to the cutters at the point of turning a very acute angle, thus causing each loose fiber to bring itself erect and easy for the shears to lay hold of. The diagrams 2 to 6 show sections of the usual beds, by which their advantages and drawbacks are readily followed. Fig. 2 is a sliding spring bed which is the usual type for shearing worsteds, the bed itself consisting of an elastic steel blade mounted in a cast-iron slide, which allows the blade to be moved

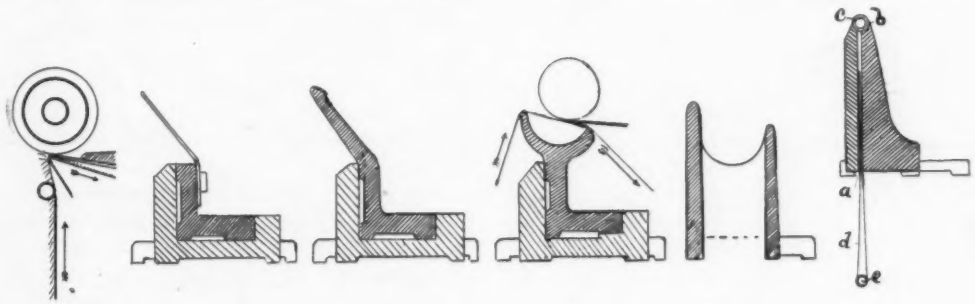

FIG 1 FIG. 2 FIG' 3 FIG. 4 FIG. 5 FIG. 6

literally while working, to keep the lists or selvedges of the cloth from under the cutters. Fig. 3 shows a solid sliding bed which is easier kept in working condition, but does not give so close a cut as Fig. 2. Fig. 4 shows a hollow sliding bed for shawls or fabrics which have knots or irregularities in the make on the back. This allows the face to be sheared fairly clear without the lumps on the back causing damage. Fig. 5 shows a section of a fixed hollow bed for cloths not requiring protection for the lists, and is used generally for fabrics requiring only superficial cutting.

Close shearing cannot be done on hollow beds, as the fabric is not pressed close enough to the cutters, but on the other hand, beds like those of the spring type while giving very close cuts will cause a damage by the smallest weavers knot or pellet of flocks. Fig. 6 is a section of a patent bed which has

many advantages over both the spring and the hollow bed. In construction this bed consists of two heavy iron castings with their parallel faces bolted together, but leaving a space of about 1/8 of an inch, Fig. 6. The top of the bed is planed up perfectly true the entire length, and is recessed as shown at b so as to carry a soft rubber tube about 7/8 of an inch diameter, which is perfectly cylindrical, made of the best and most elastic rubber, and extending the entire length of the bed. This tube, c, forms the actual bed over which the fabric travels, and while keeping the cloth close up to the shearing parts it also acts as a resilient cushion, so that a knot on the back of the material depresses the rubber and prevents a hole from being snipped out of the cloth.

The accessories to the bed consist of a cover for the rubber tube, together with an iron rod for holding it firmly in position. This cover is indispensable in order to lessen the friction of the cloth when traversing the tube, and is usually made of highly glazed calico constructed in the form of a sleeve or very wide tubing extending the whole length of the bed. As seen in the figure, this calico shield d, is passed up between the two castings of the bed, where after placing in the tube as shown, the bottom of the cover is drawn down and secured tight at e by a rod traversing its whole length. Being very highly glazed, the cover offers the minimum of friction, while it is also flexible enough to allow the knots which pass over to sink into the rubber. When the cover becomes chafed by the traverse of the cloth, the worn part is moved round for about an inch. This is repeated until the depth of the cover is used up, which is about 20 inches. The life of the tube itself averages about six months. There is no wear connected with it, but it gradually loses its cylindrical shape and becomes flabby. Oil is one of its greatest enemies, and causes it to soften and swell up. The great advantage of a rubber bed consists in the ability to dispense with knotting the backs of worsteds, a process which is slow and tedious, but which if neglected results in knot holes whenever cutting is done on the ordinary bed. Woolens are rarely sheared very close, but with worsted cloths the distinctness of the design is the important feature of the finish.

Devices for raising the fibers on the surface of cloths so that the shears can get hold of them, are restricted to brushing, raising with teazles, or cards, and glass papering. Brushing is the simplest method, and is used principally for worsteds and unmilled woolens. Raising is necessary for such woolen cloths as hair-lines and others of the same nature, where the milling has felted in loose fibers until the design cannot be seen. To get down to the bottom of the design in these cloths requires alternate dry raising and cutting, as neither can be done at one process to obtain a clear finish, but both require the shears to clear away surface wool so that the cards can get deeper into the cloth. As rough dried from the milling machine some of these cloths appear to have no design at all, and seem like plain fabrics, while the pattern does not commence to show itself until after repeated raising and cutting.

For years singeing was regarded solely as a finish for cottons and silk, and was never resorted to for wool cloths. It cannot be recommended for dyed fabrics, as it leaves a harsh feeling due to the burnt ends of the wool fibers, in addition to a very persistent smell, but for undyed worsted cloths it can be made to save considerable shearing, while the boiling which it gets in dyeing removes both the harshness and the mull. It will be found particularly useful for fabrics having large areas of floating threads similar to the well known saloils, or for those where a prominent figure encloses a sunken ground. In shearing such cloths, only the prominent parts of the design can be cut close, while the ground cannot possibly be cut clean. To some extent the tention which the fabric undergoes while passing under the shears pulls down the figure a little and allows the cutters a closer contact, but the utmost care is required in setting the machine or the top of the threads will be cut through. Where cloths of this kind are concerned, singeing may be applied with advantage, preferably immediately after leaving the loom, and

while in a perfectly dry state. Wool under any condition burns with difficulty, giving off dense fumes and leaving much charred matter behind it, so that the singeing wool goods is much more complicated than that of cotton.

Owing to the difficulty in the combustion of wool, the flame, which should be smokeless gas on the Bunsen principle, is best applied in a number of rows of small jets rather than in flames of large area, while the most efficient way of presenting the cloth to it is while passing at sharp angle, as illustrated in Fig. 1. However the machine is constructed, there must be an ample supply of air to the flame or the wool will not burn. By reason

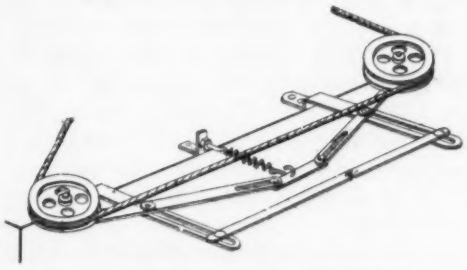

FIG. 1. A DETACHED PERSPECTIVE VIEW OF THE TENSION REGULATOR

of this, large flames which are hollow and filled with unburnt gases in the middle, leave patches of unsinged material. As the outside of the flame does practically the whole of the work, the advantage of a number of small jets is obvious. The speed of the cloth must be regulated so as not to be too high. The dryer and hotter the fabric, the quicker will it singe, so that goods immediately out of a drying machine singe better than those which are cold, while slightly damp cloths are difficult to singe at any time. This preliminary singe in the grey state does not do away with shearing the goods in the final finishing, but it very materially helps in clearing away a lot of loose stuff, and may save a couple of cuts at a later stage. For fine worsteds of the softest Botany wools there is nothing to equal the glass paper roller for lifting out fibers from the bottom of the figure. This roller is usually mounted immediately underneath the cutting parts, so that the fibers are sheared while still erect.

A TENSION REGULATOR FOR SPINNING MACHINES

The illustrations show an improved frame or tension regulator for the bands of spinning machines. The device has recently been patented in this country, the inventor giving the following description:

This invention relates to spinning machines and has for its object the provision of mechanism adapted to efficiently regulate the tension of the spindle driving band in order to obviate all slacking of the said band.

A further object of this invention is to provide a tension regulator for spindle driving bands, adapted to take up all slack in the spindle driving band in such a manner

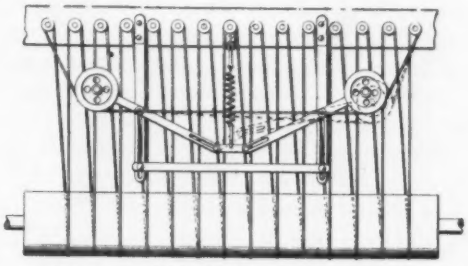

FIG. 2. THE TOP PLAN VIEW OF A PORTION OF A SPINNING MACHINE

that the speed of the driving band will automatically cause the regulation of the tensioning device in order to tighten the band.

A still further object of the invention is to provide a tension regulator for spindle driving bands which shall be adapted to automatically take up all sudden shocks or unusual strains upon the driving band, thus preventing breaking the driving band.

With these and other objects in view, this invention consists in the combination and arrangement of the various related elements of a tension regulator for spindle driving bands as hereinafter described and more particularly set forth in the appended claims.

Referring to the drawing forming a part of this application wherein similar reference numerals indicate similar parts wherever used: Figure 1 is a detached perspective view of the device. Fig. 2 is a top plan view of a portion of a spinning machine showing the device in operative position.

Secured to the usual spindle carrier sup-

port by means of screws or any other suitable fastening means, are two members, each provided with a longitudinal slot and braced at their outer ends by means of a cross rod mounted upon the members by means of bolts engaging the slots.

Sidably mounted upon the member is an arm carrying a bolt engaging the slot to allow longitudinal movement of the arm, when it is desired to adjust the position of the arm. Upon the outer end of the arm is a loose pulley wheel. A similar arm is mounted on a member and is adjustable by means of a bolt. The outer end of arm is provided with a pulley wheel. The inner end of each of the arms is provided with a slot. The arms are connected by means of a short link carrying bolts, which loosely engage the slots whereby the bolts may slide during the operation of the device. Any shock which would tend to allow either of the arms to slide outwardly in their respective slots would also be taken up by the movement of the other members within their respective slots, thus assisting the spring in tensioning the band. One end of a spring is secured to the link and its opposite end is fastened to an angle iron upon the spindle support by means of an adjustable securing device. The spring is so tensioned as to normally exert a pull upon the link member toward the spindle support and to thus cause a relative outer movement of the outer ends of the arms and the pulley wheels.

The operation of the device is as follows: The usual spindle driving band is passed around the drum and around the various spindles in the well known manner. The band is also passed around the pulleys. The this arrangement it will be seen that the action of the spring will pull the member toward the spindle support which will cause the inner ends of the arms to move in a similar direction, thus acting as levers, using the bolts as fulcrums and causing a relative outward movement of the pulleys exerting a tightening pressure upon the band, thus taking up all slack.

It is stated that since 1909 there has been a steady decline in the number of sheep kept in the United Kingdom.

SCIENTIFIC MANAGEMENT IN A COTTON WEAVE ROOM

BY WASCO

The attention given in recent years to what is known as scientific management has undoubtedly resulted in a material increase in the efficiency of textile mills. Scientific management as a study is, however, a far different proposition from scientific management in practice. As a matter of fact, there is not a cotton manufacturing plant in the country that can be run without some sort of scientific management. This statement may seem extravagant to those who are not familiar with the intricacies of cotton manufacturing and who cannot associate science with so common an industry. Nevertheless, it is a fact that scientific principles are involved in all processes through which cotton is manipulated. In no part of the mill can the principles of scientific management be better applied than in the weave room, and yet in no part of the mill has the matter received so little attention. In a weave room there are so many small details to be attended to and so many different conditions in which labor is involved that there must be some form of practical management conducted in a scientific manner if successful results are to be obtained.

One of the principles of scientific management is to reduce waste of all kinds to a minimum, whether of human energy or waste of materials. It is a question whether the reduction of the number of movements required to perform any work may be as successfully applied in a cotton cloth weave room as in other departments where the work is not involved in so many details. For example, the loom fixer's work consists in repairing and fixing looms, taking old harness out of looms, starting up new warps and many other odd jobs.

In nearly every mill one can see slack belts which slip on the pulley. Every slack belt means a loss in production in proportion to the slippage. In some mills the loom fixer tightens up the slack belts after the machines are stopped. In other mills all the belts are examined every week and all slack belts tightened. The result is very

little loss through slipping of belts. Belt dressing should be applied systematically. The belts should first be cleaned and the dressing applied according to directions given. It was the custom in a small mill of about 250 looms to apply belt dressing at the week end. On one occasion a new man applied the dressing, but did not heat it as directions stated. The dressing was put on the belts in patches with the result that considerable time was lost when starting up Monday morning. After this occurrence instructions were carefully given for applying this belt dressing.

It is almost impossible to weave cloth without having some ends break. Breakage will be more or less according to the strength of the yarn, the setting of the various parts of the loom and the regulation of the weight on the warp, together with other small details, such as having shuttles in good condition. Much also depends on the weaver's ability to handle the loom, tie the ends and keep the warp straight. A good weaver will be able to tie broken ends quickly and with a good knot so that the knot will weave through the harness and reed. If there are excessive breakages of the warp, there is something the matetr with the preliminary processes. Either the yarn is being stretched and the elasticity taken out of it in the spooling and warping process or the size is not penetrating and the yarn is being stretched or scorched.

The test of the good weaver is in keeping the warp ends straight during excessive breakage. To replace ends, extra bobbins are used or ends are taken out of the selvage and used until the broken ends come up. The good weaver will tie each end correctly as it comes up, but the poor weaver will have a crossed warp.

Another way in which time can be saved is to arrange the tie ends which the weavers use to piece broken ends. If these ends are so arranged that they will pull out easily the time required to tie a broken end is reduced, but if the ends can be readily removed from a bunch, the time it takes to tie the end is increased. A shuttle with a full bobbin should always be ready for use so that as the filling is woven off the bobbin in the loom, this shuttle may be ready. The time it takes to transfer the shuttles depends first on how the loom is stopped, second, whether there is a wide warp in the loom or not. If there is a wide warp in the loom it usually takes a longer time to change the shuttles. Time may also be wasted when the loom is stopped. The loom should always be stopped so that the shuttle will be at the side of the shipper handle.

There is always a certain amount of waste in yarn and cloth at the starting up and finishing of a warp. This should be reduced to a minimum. The cut marks should be as near the end of the warp yarn as possible and the warp ends should be tied to an apron or tied in some other way to the loom beam so that the ends may be woven up to the lease rods. In this way from 12 to 36 inches warp yarn will be saved at the end of each warp. The first cut mark should not be too far from the end so as not to make too much waste at the beginning. The first cut marks are sometimes from one yard to half a cut from the end. I once noticed in a mill that the weavers' cuts had all been entered up for the week. There were about twenty looms with the warps out. In each of these looms from 1 1/2 to 2 yards of cloth had been left on the loom. This had been left there so that it could be used as an apron to tie on the new warp. When the new warp was started up each weaver took this short length of cloth home. The mill had gone to the expense of making the warp and filling, had paid the weavers to weave the cloth and then the weavers used it. Had the mill kept this cloth it could have been sold at a loss as remnants. The remedy was to provide aprons for the looms.

Whenever a full bobbin drops on the floor it should be picked up at once, otherwise the yarn will get dirty and cannot be used. This is a loss to the mill for every full bobbin of filling represents at least two cents' worth of cotton. The bobbin, which is liable to be stepped on at any time and get broken, is worth 1 1/2 cents, so that through lack of efficiency or care every full bobbin that is wasted is a loss to the mill.

Waste is made in every department of the mill. An excess over that which is legitimate is a loss. When the weaver throws the waste on the floor it will become dirty and the value decreased. To save this waste every weaver should have bags or tin cans provided into which the waste can be put, and collected every day. A standard should also be set in supplies. A record should be kept of the number of the machine parts used. The examples given above show that by a more careful study of scientific methods and the practical application of these methods, better results can be obtained.

THE SCIENTIFIC DRYING OF TEXTILE MATERIALS

BY CHROMIUM

Waste of heat is a waste of solid cash, a fact which is beginning to be better appreciated by manufacturers than it was formerly. Even the loss of only a few heat units per hour, which have not carried away their full moisture content means a considerable loss at the week end. Under the oid drying systems it was common to find fabrics, wool and yarn dried very largely in chambers or special machines, the chief feature of which was the use of steam-heated pipes for producing the heat necessary to accomplish the drying. By these methods, the materials to a large extent became baked and harsh, losing that natural soft handle which is such an important quality factor. Moreover there was a serious waste of heat. Efficient drying depends upon the judicious application and circulation of warm dry air which quickly absorbs moisture; but this in itself is not sufficient, as air at a given temperature will absorb only a certain amount of moisture before the point of saturation is reached. It, therefore, becomes necessary to change the air. Experience has proved that it is better to accomplish drying by means of a large quantity of air at a moderate temperature, rather than by a small quantity of air at a high temperature. The former method is better for the goods as being more natural, while at the same time it is much cheaper for the manufacturer, as the cost of moving a large volume of air is considerably less than that required to maintain a small quantity of air at a high temperature.

The factors in drying are: The absorbtive power of air at different temperatures, the moisture carrying power of which is an ever-varying quantity, by reason of the varying degrees of saturation, temperature and pressure; 2, The flow and distribution of the air through the material which is being dried; 3, The heat required for evaporating the water in the material; 4, The heat lost by radiation, and by conduction from the walls of the drying chamber.

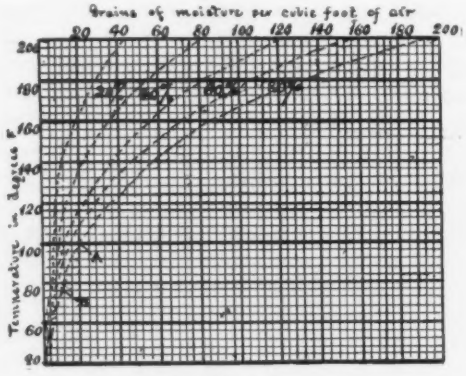

FIG. 1

The amount of moisture the air can carry is a secondary consideration. The important point is the power of absorption over and above what it already contains. Fig. 1 shows the power of air to absorb moisture, in grains per cubic foot for temperatures varying by 20° F., between 40° F. and 200° F. In the accompanying chart the temperatures are indicated in the vertical column, while the number of grains of moisture each cubic foot of air can carry before being completely saturated, is shown on the horizontal line. The large squares of the chart 1 represent 20 grains of moisture, and each small square 4 grains, consequently the vertical line, 10, cuts the curve at 3. At the horizontal temperature line 78, each cubic foot of air can carry 10 grains of water. Carried further up the chart, a temperature of 100° F. shows that 20 grains can be carried, A, or 90 grains at 160° and 170 grains at

190°. The curves marked 20, 40, 60 and 80 per cent. show how much moisture a cubic foot of air is capable of absorbing when it already contains the amount indicated. Thus at A the 80 per cent. curve shows that at 78° F. each cubic foot of air can take up 2 grains of moisture before it is completely saturated. At 100° it can carry 4 grains, while at 160° it can take up 18 grains.

The curves also show plainly that the possible carrying power of each cubic foot of

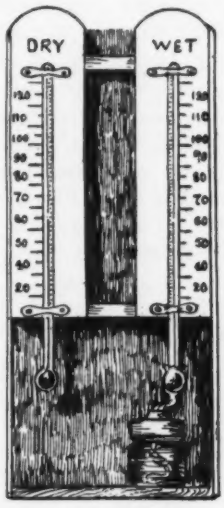

FIG. 2

air is low at low temperatures and comparatively high at high temperatures, and that the carrying power is increased by raising the temperature. These facts make it plain that air can be made to carry any amount of moisture in the proportion to which it is heated, but beyond a certain temperature other factors come into action which render it practically unworkable. The chief of these is the great loss of heat by radiation.

The wet and dry bulb thermometer is a most useful instrument, well known in the fine cotton spinning trade, where a constant humidity is of great importance. Fig. 2 shows the usual type of thermometer, which is very simple both in construction and reading. It consists of two thermometer tubes mounted side by side. The bulb of one is bare, and registers the temperature of the air, while the bulb of the other is covered with thin muslin, attached to which is a cotton wick with its lower extremity immersed in water. The muslin surrounding the bulb is moist by capillary attraction. The rate at which the moisture on the muslin is evaporated depends upon the amount of vapor in the air. When the percentage of saturation is high the evaporation will be slow, but if the air is dry the evaporation will be rapid. As evaporation implies the absorption of heat, it will be obvious that the more rapid the evaporation the greater will be the absorption of heat and lower will be the temperature of the muslin-enveloped bulb, because that bulb is in contact with the evaporating fluid. It has been found that the degree of cold thus produced is constant for a given temperature and dryness of the air. The wet bulb of a thermometer will always be reduced in temperature a certain number of degrees when the temperature and dryness of the air are the same. The following figures show the dry bulb reading corresponding to that of a wet bulb reading with reference to the percentage of saturation:

Percentage of Saturation:					
100%	90%	80%	70%	60%	50%
Dry Bulb Reading:					
75	77.5	80	83	86	90
Wet Bulb Reading:					
75	75	75	75	75	75
Absolute Moisture (grs. per cu. ft.)					
7.74	7.48	7.2	6.91	6.5	6.1

When air is heated it acquires additional powers for taking up moisture. This does not make the air dryer by removing moisture from it, but it simply increases its relative dryness. When the relative humidity of the air is low, evaporation takes place rapidly from all substances containing moisture which come in contact with it.

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In 1900 there were 52 Canadian factories producing a total of $3,875,519 worth of hosiery and knit goods annually and in 1911 there were 68 factories, the value of their annual output being $13,393,854. It is estimated that these factories produced during the past season over $15,000,000 worth of knitted goods of all kinds.

Questions and Answers

Under this head we undertake to answer, free of charge, to the best of our ability, questions pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

If the question is not of general interest to textile readers and involves expensive investigation, a charge covering the cost may be made, of which the inquirer will be advised before any expense is incurred.

BLEACHING CARD STRIPS

Editor Textile World Record:

Enclosed find a sample of what is called "card strips." We would like to have you inform us of a method for bleaching these strips, the kind of equipment to use, formula, length of time in bleach and any other information that you can give us. Bleacher (2511).

The sample of "card strips" submitted is very dirty. In the bleaching out process the material would show considerable loss in weight on account of the decomposition of the dirt. The best method of bleaching is that used for bleaching raw stock or the raw cotton as it comes from the bales. A bleaching machine should be used, as this practically completes the process without disturbing the stock until it is ready for drying. There are any number of machines advertised for this purpose in the columns of the Textile World Record, and the builders will be only too glad to furnish any information as to cost, method of using, etc.

The old system of bleaching this material was to put the stock in kiers in bundles of a certain weight, and when boiled and washed, the bundles were lifted out and usually chemicked in a vat, washed off and soured in the same vat, and again washed off in the same vat when they were ready for drying. I have no doubt but that the bleaching machine builders will advise using an extractor, as this is absolutely necessary in the washing and drying process.

There are also advertised in these columns various makes of dryers for this stock. If the kier bleach is used the circulating system is the quickest method. The still system is a little longer, but this also gives excellent results.

I am leaving the equipment question for "Bleacher" to decide for himself, and will now take up the question of bleaching solutions. Presuming "Bleacher" has a quantity of raw stock on hand ready for bleaching, it does not matter whether a machine or kier is used, the quantities will be the same in both cases. To every 100 pounds of stock allow 1 pound of caustic soda or 1 1/2 pounds of soda ash with enough water to cover the goods, which may take from 10 to 12 gallons. The stock should be saturated before it is put in the machine or kier and this should be done before the mixture of caustic or soda ash is added. If boiled in small quantities 3 or 4 hours will be sufficient; if in large quantities 5 to 6 hours will be required. After the goods are boiled it is necessary to give the stock a thorough washing to remove all residue. When the stock is thoroughly washed it is then ready for the chemic bath which is used at 1/4 to 1/2° Tw. The length of time required for the bleaching bath will depend on the thoroughness of the boil. If the stock is well boiled one-half to 2 hours is long enough to ensure the stock being well bleached. If the stock is a little short in the boil 3 hours is not too long. When the seeds are all cleared and seem loose in the stock they will drop out in the drying process and if the stock is to be put through a picker machine after bleaching all the seeds and motes will disappear. When the stock is white enough wash off the chemic and give the material an acid bath. Sulphuric acid is generally used at a strength of 1° Tw. One to 2 hours is long enough to have the material stay in this bath. It will be necessary to wash the stock between the chemic and acid baths, otherwise the material will be burned. After leaving the acid bath the material should again be washed when it is ready for drying. It is nesessary to leave the stock in the acid bath long enough to neutralize any

traces of chemic that is left in the stock after it is bleached to the required whiteness. This can be ascertained by the litmus test. When the goods are washed off after leaving the acid bath they are put in an extractor and then on the conveyor for drying. If the stock is to be pure white a little bluing should be added to the water during the last washing before putting the stock in the extractor.

If the stock is to be disinfected or made use of for absorbent cotton a little carbolic acid could be added to the boiling solution, or use a little formaldehyde in the last washing of the stock before drying. It is generally the rule to pass the stock through a picker machine before bleaching where all the motes and seeds that cannot be bleached are cleaned out. Delco.

YARN TWIST AND YARN STRENGTH

Editor Textile World Record:

Can you refer me to any tables showing the effect of different twists upon the strength of yarn? Saxon (2455).

The subject is one that is receiving increasing attention in mill practice in some quarters, but no general tables are known. In the experience of one who has devoted much time to testing the twists and strengths of yarn there is but one best twist in practically all cases. That is to say that up to a point the strength increases with the twist and beyond that period begins to decline. Thus with a few turns too little or a few too many the breaking-strain is appreciably altered. The matter is one to which sewing-thread manufacturers give a lot of attention. It is stated by way of example that 60/2 Egyptian is at its best in strength with 32 turns to the inch. It is found not only that the strength is decreased by giving a few more turns, but also the take-up rises out of all proportion. Remarkable differences in both respects have been experienced by raising the twist to 34 or 35 turns. There is no doubt that careful observation of the effect of the twist upon strength has amply repaid some who have been at the trouble to make tests on their own behalf with the materials that they are habitually using. Wessex.

COLORS FOR SOLDIER'S CLOTHING

Editor Textile World Record:

British troops wear khaki, Belgians light blue, French darker blue, Russians gray-green, Germans another sort of gray—or so I read in the papers. These colors cannot all be best. I would like to know the reason for the variations.

Contractor (2452).

The matter is rather a military one than a concern of textile manufacturers, who may, however, be excused for their curiosity. Seeing that there are always at least two parties to a fight some differences of practice are likely to continue. The combatants prefer to be able to distinguish friends from foes and the color of the uniform makes one distinctive mark. The cut of the uniform and particularly the shape of the head-dress makes another.

"Contractor" talks of "best." From what point of view? Presumably he has in mind the point of invisibility. In that aspect the best protective coloring is clearly the one which most nearly matches the surroundings of the wearer. Soldiers would have to change color like chameleons to meet all the conditions not in current warfare. Consider that in a week's campaigning a soldier may be against a background of snow, mud, grass, beetroot leaves or tree trunks. The solution is bound to take the form of a compromise. The civilian is tempted to look on invisibility as the only desideratum, but there are others. Smartness of appearance counts for a little even on active service and a uniform that was not gorgeous in its best days looks rather less dilapidated than one on which stains show in stronger contrast. In civil employments the color of working dress is more or less assimilated to the class of work and if a soldier has to work as a clay-miner he had as well dress like one.

Actually, invisibility is not quite the fetich it has been made to seem. Soldiers want to be invisible only to the enemy and have sometimes to suffer from becoming invisible to their friends. It is recorded that an old French general made a violent protest against the supersession of the traditional red trousers. In storming a position the artillery have to fire in support above the heads of their own men, leaving only a score

or two of yards to be covered with the bayonet. The general wanted to know how he was to stop the guns in time unless the advanced forces of his own side were clearly visible. This may be one reason why the military authorities hesitate to go the whole hog.

Devotees of natural science say that to render himself inconspicuous, a soldier should not be clad in any one color but in lighter colors at the head than at the foot; that the head covering should be ligher than the body and the body lighter than the legs; and that the head dress should not on any account have such an outline as will produce the effect of darkness by its own shadow. Carried too far in either direction color theories place the practical soldier at a disadvantage and for the present the policy is that of compromise. Brilliant colors have been discarded, but blank invisibility is not wholeheartedly sought and caps and helmets continue to be made in telltale shapes.

Venator.

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COST SYSTEM FOR A SHODDY MILL

Editor Textile World Record:

I am at present endeavoring to work out a cost system. Can you give us information on this point? gether with all the other departments belonging This is all we manufacture, having 30 sets of cards, 12 sets of pickers and 5 wool pickers, to to a shoddy mill, such as sorting, dyeing and carbonizing. What I find most difficult is dividing up the overhead expenses. Massoit (2456).

The principle of cost finding for mills is illustrated by the system described in the article "Estimating the Cost of Woolen Goods," which appeared in our May, 1908, issue.

Regarding the apportionment of fixed charges, we would suggest:

1. That these charges include only such expense as cannot be properly charged to some department. We have known of mills which included the wages of overseers and second hands in fixed charges, whereas they should be charged to the respective departments.

2. By the system described in the article mentioned above charges are based on the production of 50-pick cloth from the looms. This method is not suited for a shoddy mill, but we suggest that "Massoit" apportion the fixed charges pro rata in proportion to either the labor or total cost of the respective departments. For example, if the total fixed charges of the mill amounted to 20 per cent. of all other costs, then an amount equal to 20 per cent. of the total cost of a department would be charged to that department as its share of the fixed charges of the mill.

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WATERPROOFING GAUZE

Editor Textile World Record:

Enclosed find a sample of sized cotton goods. I would like to waterproof or rather rainproof this fabric so that it will retain this stiffness. Can you give me directions for such a process?

Weymouth (2462).

There are methods by which the gauze could be rainproofed after sizing, but perhaps the best method would be to mix a sizing which should itself be practically rainproof. A mixture which may be efficacious would be

Gum tragosol	100
Soap	5
Alum	3¾

Experiments might also be made with additions of wax or tallow to the sizing mixture. If these measures will serve they will probably be preferred for every reason to an after-treatment with paraffin wax dissolved in gasoline. Vaseline is sometimes added to the gasoline in order to reduce evaporation, but the objections to working with this inflammable spirit need no pointing out.

It is found in experience that some of the heavily sized cottons made in England and sized with wax, tallow, oil, etc., in addition to gums and farinaceous materials are as nearly rainproof as need be, although the sizing is not done expressly with the object of making them so. Wessex.

The sample submitted has been stiffened with a starch composition containing a small amount of color. To waterproof this fabric in such a way that the full benefit of the waterproofing treatment may be obtained, at the same time retaining the excellent stiffness that it now possesses, seems a difficult matter.

After stiffening and drying with starch, it might be possible to waterproof the goods

by passing them through a weak solution of glue, followed by a treatment with formaldehyde, the purpose of which is to render the glue insoluble, and which, when dry, will add considerable stiffness to the fabric.

Waterproofing, such as is used for soft felts, might be used to advantage. It consists of treating the fabric with acetate of alumina and finally drying. Textiles when so treated and dried are water repellant. No doubt, if the usual starch sizing is made up, replacing some of the water with acetate of alumina, a rain repellant dressing will be obtained. It is well worth trying.

Acetate of alumina is made as follows:

Solution 1

3 gals. Water.
1¼ lbs. Alum.

Solution 2

5 lbs. Sugar of lead.
1¼ gals. Water.

Each solution is made separately and then mixed with constant stirring for a few minutes. Let stand for several hours and decant the clear top liquor for use as described.

Dumfries.

REMOVING ODOR FROM BLEACHED WOOL

Editor Textile World Record:

In an issue of your magazine I note an article on bleaching wool by the use of sulphur. This article states that the odor caused by the sulphur cannot be removed unless the wool is treated chemically after being bleached. Can you tell me how to bleach wool with sulphur without leaving the odor in the material? The goods I am bleaching can be treated only with a gas and the work must be done at very low cost.

Bleacher (2461).

"Bleacher" fails to state what the article is that he desires to treat so as to remove the odor remaining after having been bleached with sulphur, but he states, however, that it can be treated only with a gas, and also that it must be done at a very small cost.

In view of the foregoing, I can only suggest the use of oxygen gas as a means of oxydizing the remaining traces of sulphurous acid still contained in the articles. Perhaps the simplest and most economical method of getting rid of the odor of sulphur remaining in the bleached goods is to expose them in some conveniently located and open place through which air circulates freely.

Berwick.

FIREPROOFING RAW COTTON

Editor Textile World Record:

Please advise us if you know whether raw unspun cotton can be treated with a solution to make it fireproof. To what extent would this treatment make cotton fireproof? What is the cost of the process per pound of cotton? Would it discolor the cotton and to what extent? Would the cotton thus treated lose any of its spinning qualities or tensile strength? Greensboro (2463).

The fireproofing of textiles has been investigated by many chemists and a number of processes have been suggested aiming to make fabrics noninflammable or as nearly so as possible. Most of the compositions, however, do not permanently fireproof the fabrics to which they are applied, for the reason that upon once washing the goods, the fireproof constituents are removed. Belonging to this class of substances may be included the following chemicals:

Sulphate of ammonia.
Sal ammoniac (muriate of ammonia).
Borax.
Ammonium phosphate.
Ammonium carbonate.
Tungstate of soda.
Alum.

These are all water soluble. Applying any one of them to raw cotton for the purpose of fireproofing it is a doubtful procedure, as the dried salts would cause considerable trouble during the subsequent manufacturing operations.

Permanent fiireproofing of textiles is to be regarded as a recent achievement of chemists, but owing to the nature of the reaction that takes place, only piece goods are regarded as being susceptible of treatment. The process is question is patented and consists of treating the material to be proofed with stannate of soda, afterwards fixing stannic oxide on the fiber by treating the goods with a solution of sulphate of soda. The success of the process depends upon the completeness of the drying of the goods after having been saturated with the chemicals. In view of this treatment, it seems doubtful if this particular process is available for fireproofing raw cotton, for the reason that the spinning qualities of the cotton would be very materially impaired.

Kashgar.

DETERMINING PERCENTAGE OF MATERIALS

Editor Textile World Record:

What is the proper method for determining the percentage of the different materials used in a garment as follows: 1 end 2/20s wool in front, 1 end 2/18s merino in back; and in a second garment, 1 end 3/21s worsted in front and 5/1 cotton back, all made on a 5 gauge machine.

Sulzer (2486).

As the yarn used in the garment consists of the same length of two different sizes, the proportionate weight of each size is found by calculating the weight for any given length. Taking the first case mentioned by "Sulzer" in which equal lengths of 2/20s worsted and 2/18s merino are used, and assuming that the merino yarn is numbered by the cotton system (840 yards per pound), the percentage of each by weight is found as follows:

2/20s worsted = 10s worsted.
2/18s cotton = 13 1/2s worsted.

Calculating the weight of say 540 hanks:

540 (hanks) ÷ 10 (hanks per pound = 54 lbs. 2/20s worsted 57.4 per cent.
540 (hanks) ÷ 13 1/3 (hanks per pound) = 40 lbs. 2/18s cotton 42.6 per cent.
A total of 94 lbs., or 100 per cent.

The same result is reached regardless of the length used for the calculation or the system of yarn numbering to which all sizes are reduced. For example, the calculation based on 360 hanks and the cotton count is as follows:

2/20s worsted = 6 2/3s cotton.
2/18s cotton = 9 cotton.

180 (hanks) ÷ 6 2/3 (hanks per lb.) = 27 lbs. 2/20s worsted 57.4 per cent.
180 (hanks) ÷ 9 (hanks per lb.) = 20 lbs. 2/18s cotton 42.6 per cent.
A total of 47 lbs, or 100 per cent.

It is necessary to reduce all the counts to the same basis.

The calculation for the second problem stated by "Sulzer" is made as follows:

3/21s worsted = 7s worsted.
5s cotton = 7 1/2s worsted.

The calculation based on 210 hanks and the worsted count is as follows:

210 (hanks) ÷ 7 = 30 lbs. 3/21 worsted 51.7 per cent.
210 (hanks) ÷ 7 1/2 = 28 lbs. 1/5s cotton 48.3 per cent.
A total of 58 lbs., or 100 per cent.

The proportionate weight of each size when three or more sizes are used can be calculated by this method. Any length can be taken as a basis, but it is advisable to choose a number (of hanks) that is easily divisible by each of the yarn counts.

When only two sizes are involved a quick method for determining the proportionate weight consists in calculating directly from the yarn counts. Thus in the first problem stated, the yarns will be used in these proportions:

9 lbs. 2/20s worsted (6 2/3s cotton) 57.4 per cent.
6 2/3 lbs. 2/18s cotton (9s cotton) 42.6 per cent.
A total of 15 2/3 lbs., or 100 per cent.

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DRYING COTTON YARN ON THE SLASHER

Editor Textile World Record:

We are having some difficulty in warping and am writing to see if you can help me out. The slasher runs 60 yarns in 1 1/2 minutes and the front roll runs 103 turns per minute. We use potato starch and a specially prepared compound. The tank holds 100 gallons of water. A batch is made with 90 gallons of water, 38 pounds of starch and 3 pounds of each kind of compound. The yarn is No. 28 cotton. The starch is boiled 20 minutes. The yarn does not dry before it gets to the beam. The slasher is running with 7 pound steam pressure. Could you inform me where the touble lies? Enclosed is a sample of the cloth I am making. Lodz (2466).

The trouble with the warp is that the slasher runs too fast for the number of yarn that "Lodz" is using. Reduce the speed one-third or put about ten pounds pressure on slasher instead of seven. Cook the size longer in the kettle, say 40 minutes. Raw size will not dry as quickly as cooked size. Keep the size boiling briskly in the box. Put 3 yards of coarse flannel on the finishing roll and on top of that 3 yards of fine flannel. If "Lodz" boils the size longer in the kettle he may have to make it a little heavier if condensed water bothers him. Minard.

SLASHER BLANKETS

Editor Textile World Record:

Please advise me as to the best slasher blanket to use for 30s cotton yarn run on a cylinder slasher. It is a good plan to cover the regular blanket with cotton sheeting?

Fairmount (2469).

I get very good results on 26s and 28s warp yarn by using a 13 ounce all wool blanket on the front or finishing roll and an 18 ounce mixed blanket on the back roll. I always card about an inch of the end of the blanket to prevent the edge from making a streak across the warp. Although I have never used a cotton covering on my blankets I have seen it used to good advantage on colored warps where the least streak would be objectionable.

Reaburn.

SIZING WARPS

Editor Textile World Record:

We are having trouble in weaving 40s, 50s and 60s yarn because of bleeding of the colors in the looms. We do our own sizing in a chain warp sizing and dyeing machine, using the following method:

After dyeing and bleaching the yarn is squeezed well and sized after wetting in a thick size of 3 parts thin boiling corn starch and 1 part potato starch. It is given one run and then dried. After drying the yarn it is given two runs through a thin starch containing 10 to 15 pounds prime tallow to about 125 gallons of water. The yarn is then dried on a cylinder dryer.

Manufacturer (2465).

I would advise doing one of two things, either reduce the speed of the slasher or increase the weight of steam used. I have run 2,000 ends, 8s yarn, sized 15 per cent., 50 yards a minute and had no trouble drying it with a pressure of 10 pounds. Almost any make of slasher is tested to 15 pounds pressure. "Lodz" is using a very light size and if he will adjust the steam pressure and speed to meet the conditions he should have no further trouble. Minard.

The trouble "Manufacturer" is having is wholly with the sizing. After the yarn has been dyed, bleached or primed, it should be thoroughly dried and run through the size box. Have the size boiling hard, using potato starch. The size should be well cooked, using 50 pounds to 100 gallons of water. Boil it 1 1/2 hours or until it looks blue. Some colors are harder to size than others, while some need more softening in order to have the size penetrate.

When running the yarn the second time, using plenty of water with just a little starch, all the sizing that was taken up in the first run is lost. Wet yarn does not take the size as well as dry yarn. The number of picks will also make a difference in the sizing. If the goods are set close they will need more starch. The best results are obtained from potato starch. When running colored yarn I would advise putting in enough tallow to keep the size from foaming. It is very important to keep the size boiling hard when running the yarn through the mixture the first time. Minard.

* *

I think the trouble it due to not drying the warps before sizing, as warps entering the size box in a wet state are not in a good condition to absorb sizing. Reaburn.

AMERICAN TEXTILE SCHOOLS

Editor Textile World Record:

Please give the names and locations of all the different textile schools in the United States.

Student (2481).

Following is a list of the textile schools in the United States. In some of them the instruction in textile manufacturing is but a branch of the school work.

Agricultural and Mechanical Arts College, Starkville, Miss.

Agricultural and Mechanical Arts College, W. Raleigh, N. C.

Agricultural and Mechanical Arts College, Clemson, S. C.

Bradford Durfee School, Fall River, Mass.

Columbus Textile School, Columbus, Ga.

Georgia School of Technology, Atlanta, Ga.

Lawrence Textile School, Lawrence, Mass.

Lowell Textile School, Lowell, Mass.

New Bedford Textile School, New Bedford,Mass.

Philadelphia Textile School, Philadelphia, Pa.

Rhode Island School of Design, Providence, R. I.

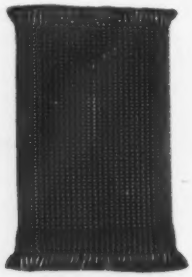
Texas Textile College, College Station, Texas.

Technological School, Spray, N. C.

WEAVING TUBULAR FABRICS

Editor Textile World Record:

We are enclosing a piece of fabric, shown at Fig. 1, that is made on a circular loom. We are



F.G 1. A TUBULAR FABRIC

interested in looms that can do this kind of work and would thank you to refer us to the builders.

Sumter (2478).

The sample shown in the illustration can be woven on an ordinary narrow fabric loom with a weave that stitches the fabric at the edges, leaving it tubular. Any ordinary fabric loom would answer the requirements. The announcements of the leading builders of these looms will be found in our advertising columns.

The method of weaving tubular fabrics on an ordinary loom was explained in the December, 1913, installment of "A Hand Book of Weaves", a series of articles that has been running in our magazine since July, 1911, and will be completed in a few months.

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CUT FACE WOOLENS

Editor Textile World Record:

I read with interest the article in your issue on fancy cut faced woolens, but cannot understand how the diagonal effect is obtained on the straight shear. Please explain the process to me.

Saginaw (2454).

This question was referred to "Wessex," the author of the article, who replies as follows:

The machine is much wider than the cloth. The knife is at right angles to the framing. The cloth is stretched fore and aft over straining rollers. The straining rollers can be swiveled to deliver the cloth at any angle up to 45° right or left. The machine was made by the defunct firm of Tomlinson, Huddersfield, and no circulars about it are procurable. The two successors of the concern each have blueprints; but only one apiece or I would send one to show the exact detail. I have seen the prints and also patterns of the cloth treated, and I think that "Saginaw's" difficulty will disappear when he realizes that the cloth stretchers can be skewed. The arrangement may be a little cumbrous, but it works. Wessex.

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FAST BLACK FOR COTTON

Editor Textile World Record:

Which is the best and fastest black for cotton, direct or sulphur black? We do not get a fast black on our cotton. I would like to get a formula for 100 pounds of cotton or 100 pounds of Seams cotton sewing. Enclosed find a sample of the raw cotton colored black. I would also like to know how to treat it in the dye kettle.

Faxon (2496).

Of the two blacks named above, the sulphur black, if properly dyed, will be the "fastest" black, while for durability, it is possible that a diazotized black will be superior to either of the above. This correspondent does not state how fast his black should be nor what test for fastness it must stand. Without this information it is difficult to advise. If the black is to resist a considerable soaping, it may be best to dye the raw stock with a direct black that will produce a deep shade with about 6 to 7 per cent., dyeing at the boil with 25 to 40 per cent. of common salt. Then run off and aftertreat with formaldehyde to which a small quantity of bichromate of potash has been added. The bath may be heated to 160° F. for 1/2 hour. This fixes the black, and gives it the property of resisting very heavy soapings.

The sample of raw stock sent appears to have been dyed in a too weak bath. There may have been the full amount of dye in the bath, but also too much water. Again, it may have been a weak dye, or there may not have been sufficient salt in the kettle to cause the dye to go on properly. It is suggested that this batch be redyed for 1 hour at the boil with 1/3 the amount of dye originally used, and with 20 per cent. of common salt. This will bring up the shade.

Berwick.

DESIGNS FOR A BASKET WEAVE

Editor Textile World Record:

In looking over the May issue I see you refer to Glen Urquhart checks in "A Hand Book of Weaves." These are in the 2 by 2 twill weave and have been very good so far this season. I think they will continue for some time, but in the 2 by 2 basket weave, in order to give a better and more novel effect. I have tried this, but am

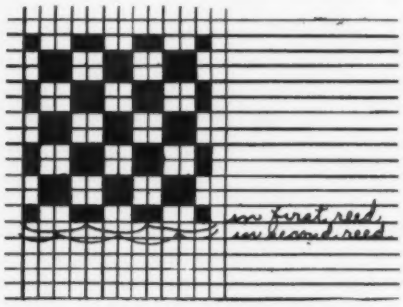


FIG. 1

troubled with one color rolling over the other. I know it is done, but have never seen a case where two reeds have to be used. In extra fine yarns there should be no trouble if 2 threads can be drawn in a dent, but when it comes to using coarser yarns, such as 2/36s worsted, it is different.

I want to use 2/36s worsted and about a 15 by 4 reed with a warp pattern about as follows:

1 end black and 1 end white for 48 ends.
2 ends black and 2 ends white for 48 ends.

I have tried this with an extra reed suspended in front of the harness splitting the 4 ends before putting them in the front reed, as you will see by the attached design, Fig. 1. This did not prevent rolling, so I attached the reed to the back of the lay, thinking that it would help by being closer, but the results were not satisfactory. It seems as if this method ought to give good results. Is it necessary to get a special reed for the purpose?

Weaver (2495).

Fig. 2 shows the design. I would draw the warp "skipping shaft" 1, 3, 2, 4. This drawing also shows how I would reed the draft to prevent the colors crossing each other.

Rolleston.

In the 4-end basket weave it is not necessary to use two reeds, as the goods can be woven with a single reed and with 2/36s worsted. It would be well to have the 15-

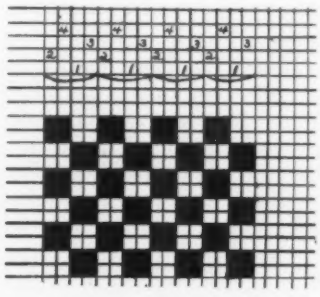


FIG. 3

dent reed made special, that is have the dents made as large as possible. This is done by having the reed made with a thinner wire. "Weaver" had better draw the warp on 4 harness instead of 2, drawing as follows: 1, 3, 2, 4, lifting 1 and 3 together and 2 and 4 together. In that way the

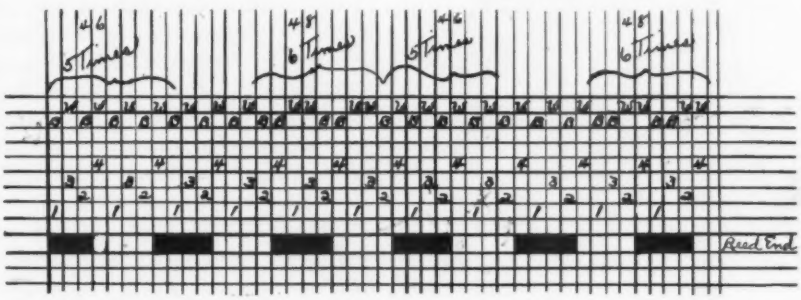


FIG. 2

threads will not come into the reed as two in one, but would be separate from the harness to the fell of cloth. Fig. 3 shows the weave, drawing-in and reed drafts. Overseer.

COMMISSION AGENT FOR PIECE GOODS

Editor Textile World Record:

A large native concern in India would like to act as commission agent for American piece goods, prints, etc. Do you know of any mills or exporters who would like to extend their business in India? Agent (2513).

[If any of our readers know of any American firm making such machinery we should be glad to learn of it.—Ed.]

Knitting Department

THE KNIT GOODS SITUATION

Most of the large buyers from the West have returned home and most of them are wondering if they bought as much as they should. Very few have placed their orders for their full requirements and they have left more openings than usual and they may get caught napping.

The values that manufacturers are offering for next spring are better than ever before and should normal times return suddenly or even within a reasonable time, we should see a rise in prices so fast that no one could keep track of the advances.

The retailer wants the jobber to carry the bag and on this account the jobber tries to pass the trouble along and get the manufacturer to relieve him of this burden. This has been going on for some time now and the question now is how far off is the time when this weight can be divided so that all will do their fair share and not try and insist that the manufacturer do it all.

Some manufacturers made a second reduction from their opening prices on the 25 cent range of balbriggans and instead of this stimulating the buying, it had a tendency to hold the buyers back as no good operator wants to buy any quantity of merchandise on a falling market and they hold back until the last gun fires. In the meantime the seller is doing most of the worrying, but it does mean one thing sure and that is as soon as a fair business has been booked, the manufacturers courage will gradually return and the result will be a slight advance and as this grade of underwear is jobbed at a small profit, the smallest advances will hurt the jobber who is out in the cold.

The small jobber is still holding back more especially in the South and they may operate too late, but at the present writing the Southern merchant wants to hold back until he has some positive assurance that cotton will move freely. They have diversified their crops more this year than ever before, having had a very serious lesson and consequently if they do not succeed in holding their copper for a big price their other crops will keep them from going through another season like the last.

HOSIERY

There does not seem to be any doubt that fancy hosiery is going to play an important part in the spring season. Naturally the jobbers are cautious and are feeling their way until they see what kind of fancies are going to be good. At the present time they are confined mostly to neat effects and if these continue in demand for a while longer, you will see these styles grdaually break out to the old rainbow colorings and when this time arrives nothing will be too bright and gaudy for this day of strong contrast and high colorings.

Twenty-five cent fiber hosiery continues to be the leading seller even although the best values have advanced in price. The manufacturers that can make reasonably prompt delivery have no trouble whatever in getting their advances and those who are fairly well sold ahead can afford to wait until they can get more money, which they are certainly entitled to, on account of the advances they are paying for raw stock.

Ladies' 15 cent white hose is also in good demand at an advance of 2 1/2 cents for the best values. Not long ago a good many mills charged 2 1/2 to 5 cents a dozen additional for white on account of the cost of bleaching together with the number of seconds made, but today the black costs more than the white for reasons we all know too well.

Children's and infants' fancy top socks are selling very well for next spring. The German manufacturers have always been an important factor here on this line and with their goods virtually shut out it will be a great help to the home trade.

SWEATER COATS

The manufacturers of sweater coats are feeling a slight improvement in the demand, but there is not enough life in it to make much enthusiasm, although they generally feel that there will be an improved condition before very long as no jobber has any stock to speak of. For some time past they have been buying actual wants only and when the retailer begins to make requests, they will demand quick shipments. Then they will be scrambling all over for merchandise and this will mean paying the asking price which will soon be higher than they are at present, even allowing for the fact that they have already advanced.

At present the best seller is the ladies' silk coat in both plain colors and fancy combinations with a fringed end belt. These are selling well in all the different qualities and it seems as though this had come to be a permanent number in all up to date jobber's hands. Formerly a silk sweater could only be worn by the wealthy and came almost entirely from abroad, but through the use of fiber silk silk coats like silk hosiery can now be worn by the many. They are made shorter than wool or worsted coats.

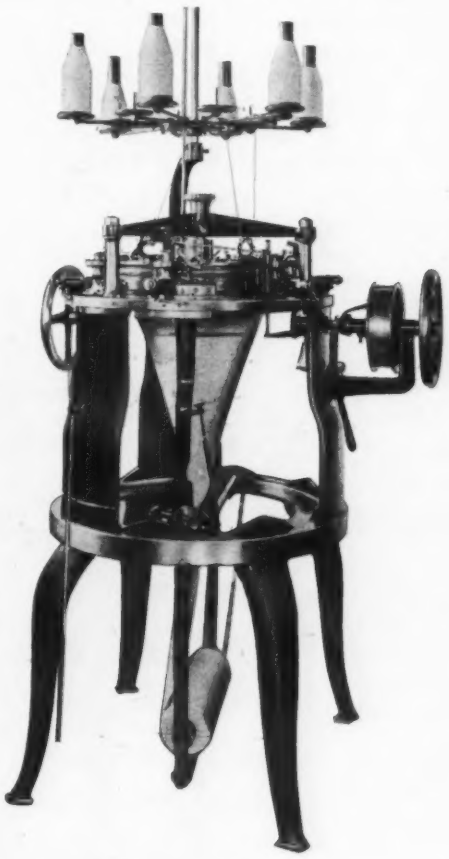
In the worsted or wool coats the plain stitch is the most popular today. They are better if made with a belt and very often are trimmed with a different color pocket flap, collar and belt.

Mr. William Cheek, well known to the trade for the past eighteen years as manager of the hosiery and underwear department and also stockholder of Smith-McCord-Townsend Dry Goods Company, of Kansas City, has tendered his resignation to that company. He has bought an interest in the Moore-Watson Dry Goods Company of San Francisco and during the early fall will become vice-president and merchandise manager for that company. Mr. Cheek is at present in the market and is receiving the congratulations of his friends on his new connection.

The total annual production of the mills in China is 200,000,000 to 250,000,000 pounds of yarn and 40,000,000 to 50,000,000 yards of cloth; during 1915,

AN IMPROVED SPRING NEEDLE RIB MACHINE

The illustration shows the improved spring needle rib machine as now built by the Crane Manufacturing Co, Lakeport, N. H. A Crane machine of this type has been in the market for some time, but the new model contains a number of improvements.



THE CRANE SPRING NEEDLE RIB MACHINE

The machine is especially designed to produce the finer grades of underwear and on certain grades of yarn makes very fine fabrics both in the Swiss and one and one rib. The feeds as now constructed are much better adapted to operate the yarns and will accommodate a wider range with a minimum strain on the yarn, as they are very easy in operation.

An improved stop motion is another

feature; it is a combination of the Crane and Crawford types. The new take-up combines simplicity and delicate adjustment with easy operation and release. All the working parts of the machine are easily acecssible and it has been designed to run at a minimum of operating expense. The general features of the machine together with the new improvements are covered by patents already issued and now pending.

This company also build a latch needle machine for rib and another type of spring needle machine for balbriggan underwear.

AN IMPROVED KNIT FABRIC

The illustrations show a knit fabric recently patented and which is designed for towels, wash cloths and similar uses for which goods of an open mesh and which dry quickly are required. The new fabric is designed to give a maximum degree of strength in the direction of the filling. The fabric has chains of knitted loops and filling threads alternately deflected to the right and left, but in which each chain of loops is formed by means of two separate weft threads forming alternate loops of the chain. The filling threads are interlaced with the weft threads in a special manner.

Fig. 1 is an enlarged view of the fabric; Fig. 2, a view on a smaller scale. The fabric is formed of two series of weft threads, a and b, and two series of warp or filling threads, c, d and e. Each weft thread of one series is interlaced with a weft thread of the other series to form loops comprising one of the series of chains, v, w, x, y, z, u, etc. The general direction of the filling threads, c, d and e, is the same as that of the weft threads, but they are alternately deflected to the right or the left either between adjacent chains or across two or more adjacent spaces between chains.

Each of the filling threads extends, through each loop, between two weft threads, a and b, of a pair.

Starting with either weft thread of any one of the chains (say the weft thread, a, at the second loop from the top of the chain, x), it extends down and through the third loop, formed by thread, b; thence up and through the first loop, formed by thread, b;

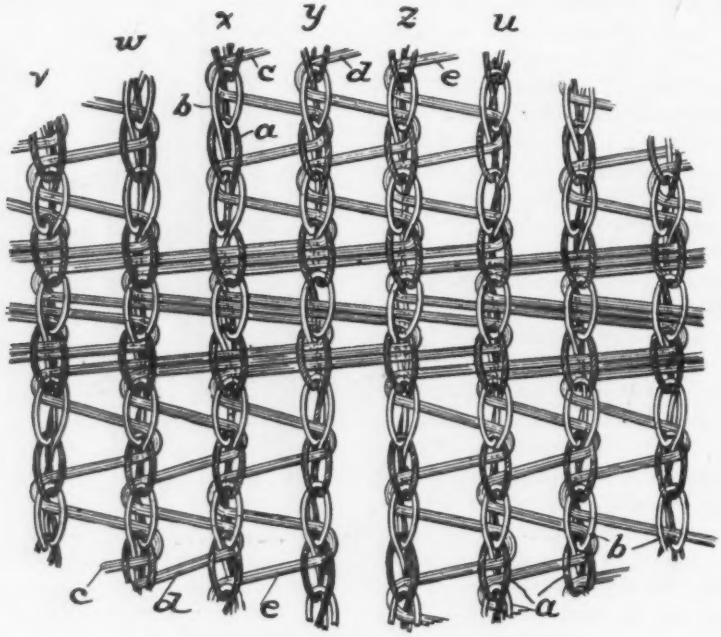


FIG. 1. AN ENLARGED VIEW OF THE KNIT FABRIC

thence down to complete the second loop and again through the third loop, and continues down through the fifth loop, formed by thread, b; thence up and again through the third loop; thence down to complete the fourth loop; and so on.

Starting with the weft thread, b, at the third loop of the same chain, x, it extends down and through the fourth loop, formed by thread, a; thence up and through the second loop, formed by thread, a; thence down to complete the third loop and again through the fourth loop, and continues

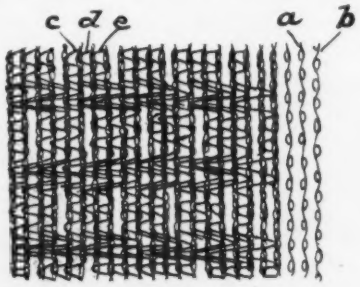


FIG. 2. A VIEW OF THE KNIT FABRIC ON A SMALLER SCALE

down through the sixth loop, formed by thread, a; thence up and again through the fourth loop; thence down to complete the fifth loop: and so on. Thus each weft thread extends alternately up the length of one loop and down the length of three loops and in its passage up and down extends thrice through each loop formed by the other weft thread.

Each filling thread extends, in its passage through a loop, back of two sections of one weft thread and in front of one section of the same weft thread and one section of the other weft thread. If the filling thread, in its extension in one direction across the fabric, after passing through one loop, does not extend beyond the corresponding given chain, it is deflected, in the opposite direction, through the loop below it and thence across to the next chain and through the loop thereof corresponding to the last named loop of the first chain. If the filling thread, in its extension across the fabric, passes across a plurality of successive spaces, it extends successively through corresponding loops of successive chains, and in its return in the opposite direction, is deflected first through the next lower loop of the last chain.

Thus starting with the filling thread, c, to the left of the first loop of chain, x, it will be observed that it extends to the right through the first loop of chain, x, and the first loop of chain, y; thence to the left through the second loop of chain, y, and the second loop of chain, x; thence to the right through the third loop of chain, x, and the third loop of chain, y; thence to the left through the fourth loop of chain, y, and the corresponding loops of chains, x, w and v; thence to the right through the fifth loops of chains, v, w, x and y; thence to the left through the sixth loops of chains, y, x, w and v; and thence back and forth through corresponding loops of chains v and w as above described.

THE FINISHING OF KNIT UNDERWEAR

BY TRENTON

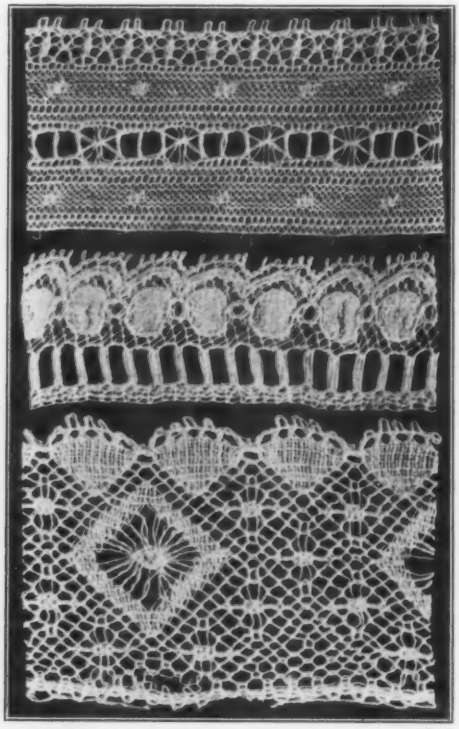
The finishing in a large mill that makes ladies' fine underwear is certainly some undertaking. Styles change with the weather, new ways of cutting, new ideas in edging, lace tape and bands are constantly introduced. There are perhaps a thousand different patterns of edging, lace and tape that are used in the finishing of ladies' underwear. Some of these different varieties are illustrated. The tape does not vary much except in quality.

The machines used in finishing are nearly the same the world over, but there are a few exceptions, such as the new flat seam, the five thread and seven thread lace sewer.

A superintendent or finisher may go to an exhibition or a display and see things that give ideas for new style of finish. Sometimes he gets ideas in curious ways; for example, one finisher sat on a desk talking when his eye was caught by the design on a magazine cover. He picked it up and remarked, "If I can double the width, leaving the bars out, it will be just what I want. Perhaps I can add the shell and it will fill the bill." Another manufacturer got a glimpse of the cut of the neck of a baby's

dress, he put this cut into his line of union suits and did well with them.

The lace and edgings shown in the illustrations are popular and a finisher can arrange any one or more into separate styles of finish. It must always be remembered that a good finish is first and quality second

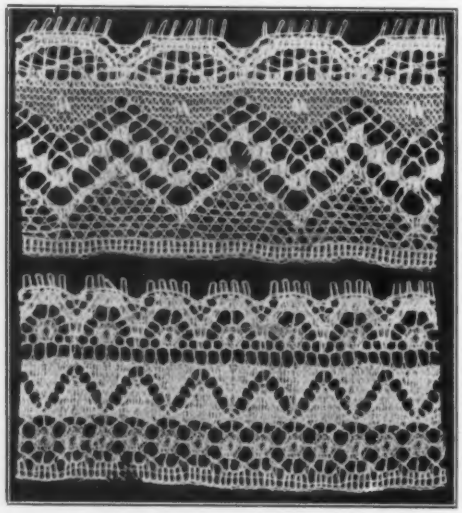


SAMPLES OF LACES USED ON KNIT UNDERWEAR

from a consumer's view. For example, a ladies' light weight pants of the better grade generally has a lace bottom, cotton or mercerized band, mercerized buttons and crotched side openings. The first thing the customer in the retail store looks at is the lace bottom, then the band, a glance at the buttonholes perhaps, then comes the last test, quality.

Men's goods do not have the variety of changes in finishing that ladies' goods do. Quality generally comes first in men's goods and finish second. The choice of finish is limited, bound neck, collarette neck, or no neck and the light weight garments are made without sleeves. Men's heavy weight shirts generally have long sleeves with cuffs. Nearly all men's union suits have the collarette neck, silk front finish, ankle length, self finish or cuff sleeves and bottom. These suits can also be made with a high neck, low neck, short or long sleeves, no sleeves, knee, ankle or three-quarter length.

The garments are made of carded yarn, combed yarn, Egyptian cotton, worsted, wool, mercerized, silk and lisle thread, cotton plated or covered with worsted, mer-



SAMPLES OF LACES USED ON KNIT UNDERWEAR

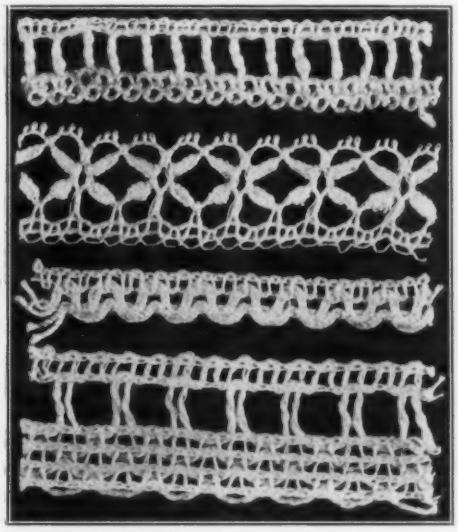
cerized plated with silk, or silk plated with lisle, or any other of the combinations. (A cheap yarn may be plated with a good combed yarn, or with colors or dyed after knitting; a cheap yarn is always used in plating).

I know of a certain concern that at one time was making five hundred dozen garments a day, with at least twenty-five different styles of finish. These included men's, women's, misses' and children's in separate garments and union suits in all weights. Added to these were corset covers, bathing suits and the old fashioned sweaters. It must be remembered also that colored goods are not finished with white goods. Most mills have what is known as a "black room," where all colored goods are handled. They are kept separate from the yarn to the fold-

ing. Colored spots on white goods often come from putting the goods down on a table where colored goods have been laying.

There are a surprising number of details in finishing and mistakes are often liable to occur. An order for one hundred dozen might be going through and one dozen of the lot might have the wrong tape, lace or edging. This dozen would have to go into stock and another dozen made to fill the order.

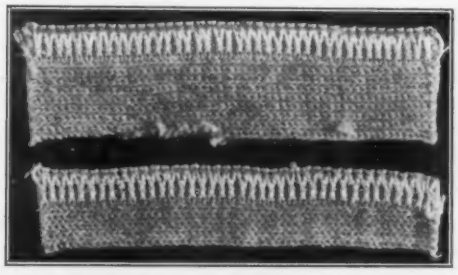
All goods on leaving the cutting table are



SAMPLES OF LACES USED ON KNIT UNDERWEAR

tied in dozen lots, with style number, order number and lot number on the ticket attached. Each operator cuts off a coupon from this ticket that corresponds with her operation of the lot. The style number denotes the style of finish, and a mistake in selecting the right trimming spoils the dozen for that order. A buttonhole operator might make three buttonholes when only two are wanted, or she might reverse it, making two when three are wanted .

The order number means that the whole lot of that number should stay together. For example, Order No. 100 is to be shipped on a certain date. The order would be knit, cut and finished and all put in the shipping room at the same time. There might be other orders going through, but those in charge would see that there was no delay. Large mills use colored tickets to rush special orders. Suppose an order for 100 dozen of one style and 200 dozen of another was to be rushed through in addition to the regular work. The 200 dozen might get a red ticket and the 100 dozen a green ticket. The help understand that the red means a rush order, the green coming next. If an operator runs out of "red work" she will take the "green work" in preference to the regular goods, and they will stick to the goods with those colored tickets on as long as they last. There are most always several operators on the same class of work, and as



EDGINGS USED ON KNIT UNDERWEAR

they are on the piece work system, it is to their advantage to keep going, so one helps the other in certain ways. A mill I have in mind had about twenty seamers, all in a row, and if one girl ran out of work, or rather caught up with what she had on hand, and went after more work and found "red work" it was at once divided up, so many dozen to each operator. This is the kind of team work that every factory does not have.

Seconds are another matter to be considered in finishing, any imperfection from the yarn to boxing must be thrown out. I have worked on a men's cheap grade garment for years, made mostly of cheap Egyptian yarn. More seconds came from poor yarn than from any other cause and next came the seconds from dirt, oil and mistakes.

Seconds in one form or another cause an endless chain of trouble, for if the inspectors let a few slip by in an order of a thousand dozen, the whole order might come back, or at least the case in which they were found would come back with a sharp note. In

many cases the buyer would want a reduction in price if kept, and would use time and postage stamps to the value of the difference in price to make his point, when as a matter of fact there might be only half a dozen real seconds in the thousand dozen.

A REINFORCED KNIT FABRIC

The illustrations show a reinforced circular knit stocking and parts of the machine on which it is made. The inventor, who has recently secured a patent on this construction, describes it as follows:

Fig. 1 shows a side elevation of a half hose. Fig. 2 shows a sectional view of a tubular portion of the stocking, on the line 2—2 of Fig. 1. Figs. 3 and 4 are respectively a partial interior view and top plan view of a knitting cam which is employed in carrying the invention into effect in a circular knitting machine. Fig. 5 is a detailed view of the needles which are employed for knitting the front portions of the leg of the stocking, and top portion of the foot. Fig. 6 is a diagrammatic view in the nature of a perspective illustrating the operation of the needles in carrying the invention into effect in accordance with the mechanism which is employed for the purpose. Fig. 7 represents a partial vertical sectional view of a knitting machine illustrating another form of mechanism for carrying the invention into effect. Fig. 8 is a top plan view of the mechanism illustrated in Fig. 7.

FIG. 2

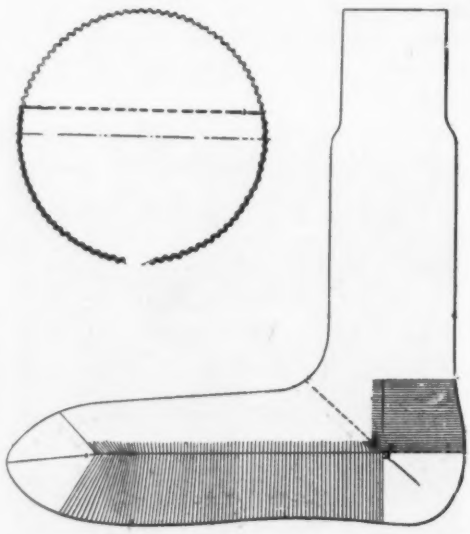


FIG. 1

FIG. 3

FIG. 4

FIG. 5

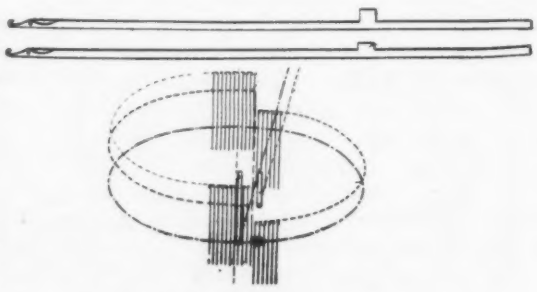


FIG. 7

In the manufacture of this stocking it is customary to reinforce the elongated sole by throwing in a splicing thread and feeding the same to the needles knitting the sole portion of the stocking. The stitch is increased in size to the extent before indicated and to float the splicing thread across the cylinder in the usual manner, the remaining needles of the circular series knitting the normal or tight stitch used in the leg or top of the foot of the stocking. The float threads are then severed in the usual manner after the stocking is finished, leaving the cut ends inside of the stocking. In some cases it has been found that on account of the great increase in the size of the stitches through the sole, when the stocking is distended on the foot in wearing the same, and also in the handling of the stockings in the dyeing and finishing of the same, the loose ends of the reinforcing threads are liable to be pulled through the last course of stitches in which

they enter so as to project from the outer side or face of the fabric and produce a line of fringe outside of the stocking which is unsightly and affects the salability of the article.

This invention is directed particularly to the securing of the ends of the reinforcing thread where it is knit into a portion only of the cylindrical tube and in stitches which are of greater size than the stitches forming the remaining portion of the tube. To this end the splicing thread is introduced at a point in the portions of the series of needles knitting the finer segment of the fabric, for a plurality of needles before and after. At each side of the series of consecutive needles which knit the enlarged stitches, the effect of which is to leave both ends of each reinforcing thread, when the float threads are cut out, securely tied into and frictionally held by a plurality of stitches of the tight knit portion of the fabric, and by this means they are effectually prevented from pulling out at either side of the reinforced fabric.

It will be understood that the main knitting thread is supplied to the needles by one thread guide and that the splicing thread is supplied by a separate thread guide. Fig. 6 shows the main thread guide delivering the main knitting thread. As shown is the diagrammatic view, the auxiliary thread guide carrying the splicing thread, delivers the knitting thread and the auxiliary thread guide preferably precedes the main knitting thread guide, as indicated. In the position of the parts indicated diagrammatically in Fig. 6, the knitting cam is supposed to be substantially in the position indicated by the dotted line extending across the figure, and on the near side of the machine. It will be seen that the drawing down cam has preceded the knitting cam and has drawn down the adjacent needles to a lower plane, while the short nib needles are not actuated by the drawing down cam and remain in the higher plane so that they will receive both the reinforcing thread and the main knitting thread, while the needles which have the long nibs will receive only the main knitting thread. As the cams pass around to the other side of the cylinder, the drawing down cam or splicing cam will continue to draw down the needles until it reaches the needles on the other side of the cylinder, which will not be affected, and which will again receive the splicing thread. This splicing thread is thus drawn across the cylinder in the form of a float thread from the needles on one side

FIG. 8

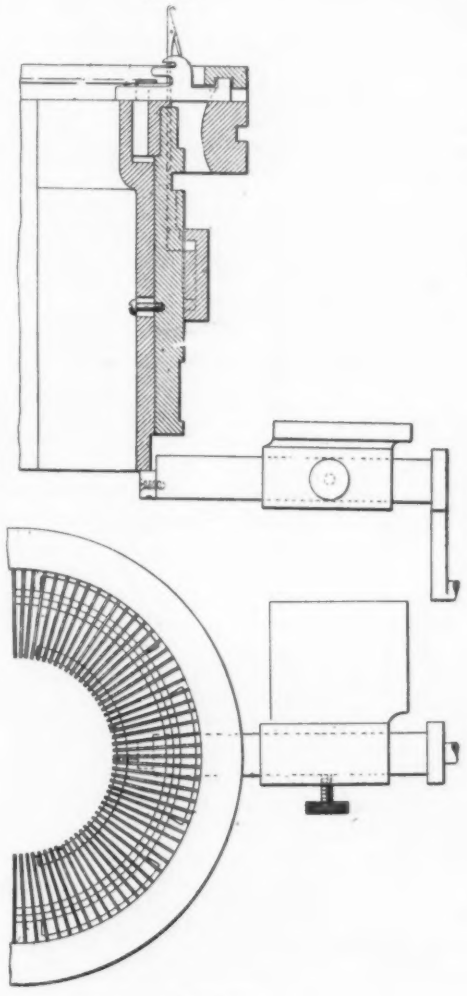


FIG. 9

to the needles on the opposite side. The needles will, of course, receive both the splicing thread and the main knitting thread during the circular knitting. The stitches formed by the needles will be increased in size during the formation of the sole portion of the stocking so as to make the sole longer

and wider than the corresponding portion of the top of the foot as before stated, for the purpose of fashioning, and may be made to draw slightly larger stitches than those made by the needles during the knitting of the high splice, if desired, for the purpose of better accommodation of the reinforcing thread, by suitable adjustment of the lower knitting cam.

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WEIGHTS OF HOSIERY

Editor Textile World Record:

Please inform me what weights of hosiery are obtained by using yarn and machines of different sizes, for example:

No. 16 yarn on 176 needle 3 3/4 cylinder
No. 15 yarn on 176 needle 3 3/4 cylinder
No. 14 yarn on 176 needle 3 3/4 cylinder
No. 13 yarn on 176 needle 3 3/4 cylinder
No. 12 yarn on 176 needle 3 3/4 cylinder
No. 24 yarn on 200 needle 3 3/4 cylinder
No. 22 yarn on 200 needle 3 3/4 cylinder
No. 20 yarn on 200 needle 3 3/4 cylinder
No. 19 yarn on 200 needle 3 3/4 cylinder
No. 18 yarn on 200 needle 3 3/4 cylinder
No. 17 yarn on 200 needle 3 3/4 cylinder
No. 16 yarn on 200 needle 3 3/4 cylinder

Also give the weight for ladies' goods with a 1 1/2 to 2 inch hem knit on 176 needles and also for 200 needle goods with a 2 1/2 to 3 inch hem.

Winston (2500).

I will give the weights according to the figures as they work out and according to a given basis, as follows for goods knit on 176 needles and a 3 3/4 inch cylinder:

No. 16 yarn ..... ozs per doz 26
15 yarn 28
14 yarn 30
13 yarn 32½
12 yarn 35

A single 18s on 200 needles should weigh about the same as single 14s on 176 needles. If the weight per dozen for one size of yarn is found, it is easy to find the weights for other yarns by simple proportion.

Ex. Hosiery made with a single 18s yarn on 200 needles on 3 3/4 inch cylinder weighs 30 ounces per dozen. Find weight of goods made with 16s yarn.

The weights of the stockings is in the same proportion as the weight of the yarn.

18s cotton = 55.5 grains per 120 yards.
16s cotton = 62.5 grains per 120 yards.
Then: (62 1/2 × 30) ÷ 55.5 = 33.7 ozs. per dozen.

The weights of the goods are also in reverse proportion to the yarn count, so that the calculation can more easily be made as follows:

(30 × 18) ÷ 16 = 23.7 ozs. per dozen.

The weights of half hose are always based on the 10 1/2 size, that size being the middle size and considered the average. This is made on 176 needles. 3 3/4 inch cylinder of 14s yarn will weigh 18 ounces per dozen. Other sizes of yarn can be figured the same as the table given for ladies' hose. It is generally the custom to use a heavier yarn for the ribbed top and for 14s foot. A 12s yarn is generally used for the ribbed top. Other sizes of yarn in proportion. Unless an extra heavy heel and toe is desired a 36s to 40s single yarn is used as splicing.

Cipango.

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FLAT AND BALBRIGGAN KNIT GOODS

Editor Textile World Record:

Please give us the meaning of the terms "flat" and balbriggan as applied to underwear.

Manufacturer (2503).

The term ""flat" as applied to underwear properly means all knitted underwear knit flat; that is to say, underwear knit on a "full-fashioned machine." "Flat" underwear made on flat machines have selvage edges. The shirts have a selvage edge on each side of the body, which are sewn together, but without any seam on the shoulders. Being knit "flat" it is made double length and turned over at the shoulder. The drawers knit flat have a selvage edge on the inside of the leg, and the sleeves for the shirts knit "flat" also have the selvage edge on the under side of the sleeve. There are also "flat" cuffs and round cuffs, those properly called "flat" being knit flat, and the round ones are knit on circular knitting machines.

Sweaters are knit also on flat machines but the term "flat" has not been applied to sweaters. A large number of styles of hosiery are also knit on full fashioned machines but the term "flat" has never been applied to hosiery or sweaters but only to underwear. The term "flat" has also been applied to underwear "cut out" and then seamed up, but the term is then improperly used, as it should only apply to underwear that has

been knit on flat machines, which make selvage edges.

The term "balbriggan" as applied to underwear properly means knitted underwear, whether made on flat or circular knitting machines, which is made from genuine Egyptian yarn, that is yarn made from Egyptian cotton. There is a lot of underwear called "balbriggan" which is not balbriggan at all, as it is not made from yarn made of Egyptian cotton. This false balbriggan underwear is made from white cotton and then either the knitted cloth or the garment is dyed to the Egyptian shade. This color of Egyptian cotton, dyers have found very hard to match exactly. When a dyed Egyptian garment is seen apart from a genuine balbriggan the difference is not noticeable, but when the two are seen together the difference in shade or color is very apparent.

Balbriggan as applied to hosiery also means hosiery made from Egyptian yarn. It is generally supposed the term balbriggan originated from an old seaport town in Ireland named Balbriggan in which this kind of hosiery was first made, and was afterwards applied to underwear made from this Egyptian yarn or cotton.

The term "flat" has also been applied to underwear knit with the plain stitch and nearly all flat underwear is knit with this stitch, but there are other goods knit on flat machines which can properly be called "flat" goods, such as sweaters, cardigan jackets, mufflers and ties which are knit with a tuck and ribbed stitch, hence the confusion as to the term "flat." Lafayette.

HOLES IN KNIT GOODS

Editor Textile World Record:

We are enclosing samples of knit goods which you will note have a number of small holes, the cause of which is a puzzle to us as we have traced the cloth from the knitting machines to the cutting table. The 2 and 2 rib was knit on a Scott & Williams body frame, cut 14 needles to the inch. The 1 and 1 rib was knit on a Cooper spring needle machine, cut 16 needles to the inch.

Knitter (2484).

The only way one can determine positively where these holes were made is to examine the cloth after it is knit and again after it has passed through each machine to prepare it for the cutters. The holes are probably cut by a pair of tight rollers that have rough spots or sharp projections on them, but they could be caused by a sharp instrument striking the cloth while it was on a turning or dry pipe. The knitter should carefully examine the rollers on the knitting machine take-up, the turning machine and any other machine, such as bleaching tubs or dryers, that the cloth passes through. The cloth has apparently not been stretched much after the holes were made so they probably were made on the last machine before going to the cutting table. It is very evident that the holes have been cut and not torn by catching on a nail or other sharp point.

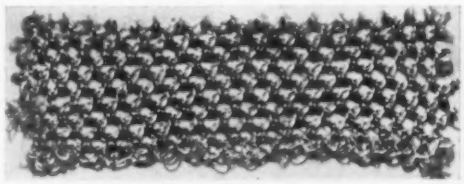
Herkimer.

WARP KNITTING

Editor Textile World Record:

Please inform me on what kind of knitting machines the enclosed samples are made and if the stitch on both is the s me? Knitter (2507).

The two samples enclosed are made on warp knitting machines having the necessary attachments for this class of goods. The machines are 30 gauge or 20 needles to the inch. Louis Hirsch.



TWO FANCY KNIT SAMPLES

The two samples are made on a warp knitting machine, about 20 needles to the inch, spring needle. The yarn is dyed in skeins instead of in the piece Gama.

Dyeing, Bleaching, Finishing, Etc.

LOGWOOD DYES

BY BERWICK

Since the European war, and the consequent shortage of artificial dyes, unusual attention has been given by dyers to the possibilities of using the natural coloring matters, particularly logwood, as temporary substitutes for the usual blacks and blues.

While logwood has remained with us through all the years of chemical activity, it has been gradually relegated in many mills to a position of little importance, until the dyer was compelled to resort to the older dyes to keep his mill moving. On all-wool goods, logwood is capable of yielding handsome blacks and dark blues, provided the dyer takes sufficient time to prepare his goods, not only during the scouring, but during the mordanting.

If woolens and worsteds are not thoroughly clean and free from grease, dirt, and soap, it will not be possible to properly mordant, and if the mordanting is defective, the final dyeing will likewise be defective. Therefore, give plenty of time in the scours and by all means aid the scouring of the pieces by using a little ammonia which always leaves the pieces cleaner than when the scouring is done with soda alone. When mineral oils are on the pieces, complete freedom from grease is not to be expected, but where good, easily and completely saponifiable wool oil mix is used, the scouring with ammonia offers no difficulty.

For a good chrome black, 3 per cent. of chrome is necessary, 5 per cent. argols, and 1 per cent. of oil of vitriol, although instead of argols, lactic or formic acids are frequently employed and with good results. It is not necessary to boil during the mordanting, but the bath should not go below 200° F. for 1 to 2 1/2 hours, when, after washing, it is ready for dyeing.

Too much chrome, that is, more than 3 per cent., is sure to yield a black that will look good at first, but which will turn green later. To overcome a possibility of this, the dyer should add a small amount of either cudbear or alizarine red if he has any, during the logwood dyeing. The dye bath is made up with either a decoction of 75 pounds of chipped logwood, or with 15 to 18 pounds of solid logwood extract. The dyeing proceeds at the boil for 1 1/2 hours. For a fine jet shade a small quantity of extract of fustic is always used.

To guard against the logwood dyeing "bleeding," it is necessary to "back chrome," that is, entering the dyed goods into a fresh chrome bath containing from 12 ounces to 1 pound chrome, and heating to 175° F. for 1/2 to 3/4 hour. This treatment fixes the color and prevents crocking or bleeding. Of course, the cloth is finally well washed before finishing. There are many formulas for logwood dyeing, each dyer has his own pet one, but they are all based upon the above practice.

Excessive chroming tends to influence greening, and in this connection Rawson has pointed out that a black containing as little as 1.1 per cent. chomium did not green, while one containing 1.6 per cent. greened distinctly.

A well made piece of cloth, thoroughly well cleansed, and properly mordanted and dyed according to shade desired, using logwood, fustic, etc., is greatly increased in value if it is thoroughly washed after dyeing and finisning. Poor finishing has much to do with full, bright shades, almost as much as dyeing. While not much employed at the present time owing to the cost of handling, the use of fullers earth always gave a handle to fabrics that cannot be duplicated by any other method. This simple though effective method of washing, constituting one of the most important stages of wool cloth finishing, is the cause of so much admiration bestowed upon many loom products.

Logwood blues on wool are produced in much the same manner as the blacks, with the exception that no fustic is used. Regulating the amount of bichrome and the other mordants, governs the depth of shade. Old dyers who were choice of their secrets used tin crystals to "spring" logwood blues and throw them over to a purplish tone, but this may be done equally as well by using some alizarine red if it is at hand, besides giving a faster tone.

Indigo played a most important part in the production of logwood blues, being applied as a "bottom." A brighter blue is possible, according to a very old recipe, by mordanting with 6 per cent. alum and 6 per cent. of tartar (argols). Chalk was added to the bath if the water used was not particularly hard, limey water being necessary for the success of the dyeing.

The use of tin crystals above alluded to suggests its employment for purples which was common practice, but the shades obtained were far from being fast as we now understand the term "fast."

On cotton, logwood has always played a most important part, especially for cheap blacks and grays—being rarely used for other shades. Formerly, the cotton was padded with a tannin such as cutch, then with nitrate of iron, then again in cutch, again in iron, this time it is the acetate, standing at 4° Tw., then pass through lime water, and finally wash. The cloth is now dyed by being run through a jig containing the logwood infusion, with or without fustic as the shade calls for, and always with a little bluestone. A final treatment by afterchroming, washing and soaping imparts a most desirable handle and improves the shade.

One-bath blacks for cotton piece goods are obtained by means of the noir re duit process which is as follows: Dissolve 10 pounds bichrome in 6 1/2 gallons of acetic acid, and add to this solution 12 1/2 gallons of 51° Tw. logwood extract, and stir until thoroughly mixed. Then add in the following order, 25 pounds chrome alum, 1 1/2 pounds oxalic acid, 1 1/2 gallons sodium bisulphite at 64° Tw., and 3 gallons black iron liquor at 15° Tw. Heat to 165° F. and stir occasionally during several hours.

The padding color is prepared by taking 15 pounds starch and working it into a paste with 6 gallons water; then add 4 1/2 gallons of black, 1 1/2 gallons of acetic acid, 1 gallon tragacanth thickening, 1 pint olive oil, and 1 quart of fustic extract. Boil well together, and add 1/2 gallon solution of acetate of chrome at 32° Tw., 1 quart bisulphite of soda, and 1 quart of turkey red oil.

The pieces are padded with this, steamed to fix the color, passed through a light chrome bath, washed, soaped, and finally washed.

DYEING WITH VEGETABLE AND MINERAL DYESTUFFS

BY CALDERON

During the last few months much has been written concerning the application of the above dyestuffs to the cotton fibers, but in the opinion of the writer many details are wanting. It is the purpose of this paper to fill in some of these details. To dyers of the old school, these observations may recall to mind many interesting experiences; to dyers of a later period it is hoped they may prove instructive. As these notes are primarily intended for the use of dyers, it is assumed the properties of the dyestuffs are fairly well known.

A few examples (from actual practice) will be given of the application of these dyestuffs; they will serve as a guide for further experiments. Obviously, a rise in temperature, time of immersion in the dye bath and varying proportions of the ingredients will give rise to a variety of shades. To an intelligent dyer it opens up a field of interesting experimental work which should be found helpful in producing such a great variety of shades. It will be found convenient to make up the following standard solutions, all of the same concentration, say 10° Tw.

Catechu: Boil in the requisite quantity of water until dissolved. To every 10 lbs. of catechu add 1 lb. of bluestone. Strain before use.

Sumac, Fustic and Logwood Extracts:

Dilute with hot water to the required strength.

Copperas: Dissolve in boiling water and filter.

One hundred lbs. cotton yarn (fawn): To the requisite quantity of water add 2 gals. cutch solution, temperature 120° F., give 7 turns, lift, add 1 gal. copperas, give 5 turns, run off, prepare a fresh bath, temperature 100° F., add 1/2 lb. bichromate of potash, give 3 turns and rinse.

Five pieces (jig dyed): Three gals. cutch, give 5 ends, add 1 gal copperas, give 3 ends, run off and to a fresh bath add 1/2 lb. bichromate of potash, give 3 ends, rinse. Same temperatures as above.

These shades are further modified by the addition of logwood and fustic to the first bath. Fustic gives the yellow part; logwood gives the blue part; addition of both gives the green part. With a little experience it is surprising the numberless shades that can be obtained by a judicious mixture of the above ingredients.

Slates, Greys, etc.: Same quantities and temperatures as above.

Cotton Yarn: Two gals. sumac solution, 5 turns, lift, and add 1 gal. copperas solution, give 3 turns, run off bath and rinse.

Piece Goods: Three gals. sumac solution, 5 ends, add 1 1/2 gals. copperas, 3 ends, run off and rinse. By using tannic acid in place of sumac extract and by using a fresh cold bath for the copperas solution, clearer shades are obtained. Addition of fustic and logwood to the tannic bath modifies the shades.

Ivory, Light Buff, etc., for 100 lbs. Cotton Yarn: Make up a bath of cold water, add 1 gal. nitrate of iron (66° Tw.), give 5 turns, lift and wring. To a fresh bath of cold water add 2 lbs. Soda Ash (previously dissolved in water), give 3 turns, rinse and dry. Clearer shades are obtained on a bleached bottom.

Piece Goods: Better results are obtained by the padding method. Make up a solution of nitrate of iron 1/2° Tw. Pad once through this solution on an ordinary 3 bowl mangle; take the precaution that the bowls squeeze evenly, otherwise patchy results are obtained. Fix on the jigger in a cold solution of soda ash 1° Tw. Rinse and dry.

Another method for dyeing light shades is as follows: Work in a cold bath of pyrolignite of iron 1/4° Tw. and fix with caustic soda. This method is not to be recommended for solid colors. The goods are liable to turn up uneven, probably owing to the tarry matter in the pyrolignite.

Dark Buff for 100 lbs. Cotton Yarn: Prepare a bath of copperas 1° Tw. ordinary temperature, give 5 turns, lift and wring. Fix in cold clear lime water, giving 3 turns, rinse and wring. Replenish copperas bath to original strength, reenter yarn and work as above, fix in lime as usual. A copperas and a lime bath is termed one round; to get a satisfactory dark shade as many as ten rounds are given. After the last round work for 15 minutes in a boiling bath of caustic soda 1° Tw., rinse well and dry. This method gives an excellent fast color, especially to light, alkalies and chlorine. If properly dyed (i. e., the copperas bath is not too concentrated) the fastness to acids is very good.

Black for 100 lbs. Cotton Yarn: Steep 12 hours in a boiling solution of 20 per cent. sumac extract (use as little water as possible, wring and pass into a bath of pyrolignite of iron 4° Tw. ordinary temperature, give 5 turns, lift and allow to lie 6 to 9 hours. Fix in a 3 per cent. chalk bath at 100° F., give 5 turns and rinse. If preferred, lime water may be used in place of chalk. Prepare the dye bath with 15 per cent. logwood extract, temperature 120° F., enter yarn, give 3 turns, raise to boil, lift and add 1 per cent. of copperas, give 3 turns, allow to lie a few hours, then rinse. The percentages are calculated on the weight of the yarn.

Piece Goods: Steep as above, squeeze and pass through a bath of pyrolignite of iron at 8° Tw. on an ordinary 3 bowl mangle. Allow to lie in the rolled-up state for a few hours. Fix in boiling lime, give 3 ends and rinse. Prepare the logwood bath as for yarn, give 2 ends, raise to boil, give 4 ends, add 1 per cent. copperas, give 2 ends, rinse and allow to lie a few hours before drying. The color is improved by passing through a bath of weak starch. This method gives a good

blue-black. If not practicable to steep in the sumac extract, give 8 ends, boiling on the jigger in as little water as possible. Percentages as for yarn.

Dark Brown for 100 lbs. Cotton Yarn: Steep in a 30 per cent. boiling bath of cutch for 12 hours, wring and enter a 3 per cent. boiling bath of potassium bichromate, give 3 turns and rinse. This process may be repeated for darker shades. Percentages calculated on the weight of the material.

Piece Goods: Use same percentages as above. Give 7 ends in the boiling cutch bath, run off, give 3 ends in the boiling chrome, rinse and dry.

Dark Chocolate: Add 2 per cent. Logwood extract to the cutch bath, and then pass into a bath of pyrolignite of iron 2° Tw. (normal temperature), work 15 minutes, wring and chrome as above.

Imitation Khaki for 100 lbs. Cotton Yarn: Make up a bath at 120° F., add 3 gals. cutch, give 7 turns, run off and enter a fresh bath at 100° F., add 1/2 lb. Bichromate of Potash, give 3 turns, run off and rinse. Make up a bath at ordinary temperature, add 1 gal. fustic, give 5 turns, lift, add 1 gal. copperas, give 3 turns, run off and rinse.

Khaki on Piece Goods: Pad the dry well scoured pieces on a double padding machine with heavy pressure on the rollers through the following mixture: 13 parts water, 9 parts Acetate of Chrome 28° Tw., 8 parts Pyrolignite of Iron 22° Tw. Dry over cylinders or in the hot flue, age or steam in a Mather & Platt's ager, pass through boiling soda-ash at 3° Tw., rinse and enter a bath of silicate of soda at boiling temperature 2 1/2° Tw., work in this bath for 1/2 hour, run off.

A NEW BLACK FOR HOSIERY

A number of manufacturers, dyers and others attended the commercial test of the new black for hosiery which is the invention of W. Ames, Jr., at the plant of the Bangor Silk Knitting Co., Bangor, Pa. Opinions seem to be somewhat divided as to the results obtained, but those interested in the proposed new company which is to manufcture this new dyestuff were very confident that the lack of fastness which was pointed out by some of those present would be successfully overcome. The process gives a good shade and is comparatively easy to apply. In its present form it is intended for use on cotton and silk.

THE BLEACHING OF COTTON AND LINEN MIXED GOODS

BY CALDERON

It is not the object of this article to enter into a scientific discussion of the bleaching of union goods, but rather to give a few practical hints on the difficulties that constantly arise during the bleaching itself.

In the bleaching of linen the same principles are involved as in the bleaching of cotton, that is, to free the fiber from its impurities by treatment with alkalies, acids, chlorine; etc. While cotton only contains 5 per cent. of foreign matter, which is easily removed without any noticeable weakening of the fiber, raw flax contains from 20 to 25 per cent. of impurities, principally consisting of fats, waxes, pectic bodies and the so-called sprits. These sprits, small particles of woody fibers, are exceptionally troublesome to remove. As the warp is generally cotton and the weft linen, manufacturers have a tendency to use the weakest and cheapest kind of linen yarn for their fabrics.

The disparity between the two fibers is considerably widened by this method of using cheap yarns. One or two boils followed by a chlorine and acid bath is quite sufficient for cotton, whereas in linen a series of alkaline boils previous to any treatment with chlorine is absolutely necessary. This is again followed by more alkaline boils with further chlorine and acid treatments. The difference between the physical properties of the two fibers requires consideration. Cotton is considerably more tractable than linen, hence the greatest care is required in the mechanical handling of the material.

The whole process is slow and laborious and requires constant care. Time is a most essential feature to keep in mind. Notwithstanding that much research work has been done, the general process has not altered

materially during the last forty years. If manufacturers could be prevailed upon to use better yarns the process could be much simplified. As this is not likely to take place the bleacher has to make the best of the situation.

The most difficult part of the bleacher's work is the removal of sprits and the tendering of the goods. Sprits are only removed by successive alkaline boils followed by the usual chlorine and acid baths. It frequently happens that the goods are thoroughly bleached a pure white, but still the sprits are only partially removed. Then follows the treatment over again, boiling, chemicking and souring. Before deciding on the strength of the chemicals and the time required the bleacher has to consider the strength of the material. He asks himself the following questions: What shall I give this lot? Will the goods stand any further treatment? He thinks hard, examines the goods time after time, leaves them until the next day and then goes through the same mental process.

Another point that arises is the common fault that some bleachers have in chemicking the material too early in the process. It has been proved both experimentally and practically that if chlorine be allowed to act on fabrics which have been imperfectly heated with alkalies the fatty bodies are oxidized in such a manner as to be rendered almost insoluble. If this occurs it is absolutely impossible to obtain a perfect bleach. Sodium carbonate has no action on certain resinous or fatty bodies. Caustic soda in some form must be used during the alkaline boils.

The bleaching power of old chemics has to be considered. The activity daily increases, hence a period arrives when it is positively dangerous to use the old chemic bath any further. This subject has received much attention of late. Higgins' explanation seems most reasonable. He suggests that when freshly prepared bleaching powder solution is added to an old chemic, the free line is thrown down, and thus the bleaching power is increased.

The whole process of bleaching may be divided into a series of lye-boilings separated by chemic and sour baths. Unfortunately it has been shown in practice that after chemicking, the fiber is more readily attacked by alkalies than before, hence the necessity for employing none but mild alkalies subsequent to chemicking.

The following process is recommended from a consideration of the above:

Lye-boil before chemicking to consist of
80 per cent. sodium carbonate (pure alkali).
20 per cent. caustic soda (70 per cent.).
Lye-boiling after chemicking to consist of
Sodium carbonate (pure alkali).
First, lime boil, 12 hours. Wash.
Second, sour, hydrochloric acid 2° Tw. Steep 12 hours. Wash.
Third, first lye boil, 5° Tw., 12 hours.
Fourth, second lye boil, 4° Tw., 12 hours. Wash.
Fifth, third lye boil, 3 1/2° Tw., 12 hours. Wash.
Sixth, Chemic 1/2° Tw. Steep 12 hours. Wash.
Seventh. Sour, sulphuric acid 1 1/2° Tw. Steep 12 hours. Wash.
Eighth. Fourth lye boil (scald) 2° Tw., 6 hours. Wash.
Ninth. Chemic 1/3° Tw. Steep 4 hours. Wash.
Tenth. Sour 1 1/2° Tw. Steep 8 hours. Wash.
All boils at atmospheric pressure.

If the above processes are properly carried out the fabrics at this stage are white enough for finishing, but in many cases the sprits are only partially removed. When that occurs the goods are treated as follows:

Eleventh. Scald. 1° Tw. with 1 per cent. white soap. Boil 4 hours. Wash.
Twelfth. Chemic. 1/8° Tw. Steep 4 hours. Wash.
Thirteenth. Sour. 1° Tw. Steep 6 hours. Wash and finish.

FINISHING NOTTINGHAM LACE CURTAINS

Editor Textile World Record:

I have read with interest the question asked by "English" (2426) which appeared in the June issue regarding the fluff on Nottingham lace curtains. I have had the same trouble and will give my remedy for it. I was working in a lace mill where the tom-tom system was installed, also a rope washing machine or Scotch system. I used the tom-tom for the bleached goods and the Scotch washer for ecru goods that needed scouring only. I found that the goods that were bleached in the tom-tom were fluffy. Goods of the same kind scoured in the Scotch washer were not so bad so I changed

things around. When I got goods made of coarse peeler yarn I ran them through the Scotch washer instead of the tom-tom. This helped some. Then I found out that instead of running the goods in pits in the usual way, which caused them to be run end for end, I would have to run them all one way. I fixed things in such a way that the first end on top of the kier was the first end all the way through the bleaching process. At that time I was using two rollers in the bottom of the starch box, Fig. 1, so I had the mangle belt crossed and in that way had the mangle run the opposite way. Pulling the goods through the starch mixture brought the fluff up, but by running them through the starch box, as shown at Fig. 2, a nice clean face was the result.

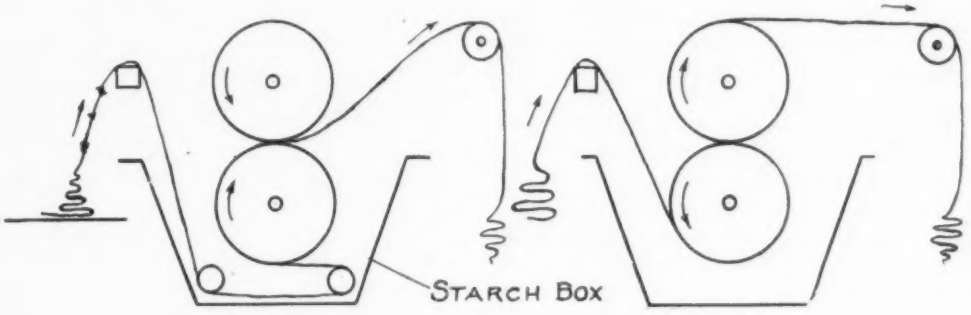


FIG. 1 FIG. 2

I had a set of six drying cans at the back of the starch mangle and I found that because of the starched goods going onto the hot cans direct that the fluff would be pulled up, so I covered the first two cans with muslin. I then ran the goods direct from the cans to the hot roller tenter. These changes cost nothing and the results were very satisfactory.

It would be necessary to have an experienced man to run a singeing or dressing machine. Regarding the dressing mixture, I have used glue, but I prefer white dexteine. If "English" does not use drying cylinders or cans between the starch mangle and tenter I would advise covering the first hot roller on the tenter. Hector.

LUSTER FINISH

BY WESTON

Not long ago the writer's attention was called to a difficulty a mill was having with a line of light weight broadcloths made for women's wear. The complaint was regarding the luster not only that it was not as good as was desired, but that there was a variation in it, some pieces having a better luster than others. This the manager was unable to account for, since all were put through exactly the same steaming process, and so it seemed to him, should have the same luster. I managed to procure some samples of the cloth, and found the case as he had stated it, but a close examination of the samples disclosed the real cause of the trouble, which confirmed my opinion, that the fault was not in the steaming so much as at some other point in the finishing process. Since it is generally considered that the steaming process produces the luster, it would seem to follow that any lack of luster must be due to a defect in the steaming. But there are other things equally as important as the steaming to insure the best results in a steam luster finish, and this fact easily accounted for the trouble in question. It is a mistake to assume that the luster is wholly due to the steaming process, or even to think that the steaming adds very materially to the luster of the individual fiber. The previous process of napping or gigging to secure a suitable nap is equally important. This insures a perfect

parallelism of fibers upon the surface of the cloth, and the steaming process serves to make this parallelism permanent, which has more to do with insuring a luster than any effect upon the stock or the individual fiber.

The broadcloth as it comes from the wet gigging or final brushing before the steaming while in its wet state, shows about the same luster as in the finished cloth, because of the straight and closely laid fibers of the nap. If the cloth is dried without steaming, the fibers will resume their former curly state and the nap a loftiness that means a lack of luster. As an illustration of the necessity of a well laid nap, brush up the nap upon a silk hat and see how soon the shine disappears, despite the fact that the silk fibers are the most lustrous of all.

That the napped condition of the face of the cloth is an important factor in securing a good luster may be readily seen by noting the fact that the back of the broadcloth shows much less luster than the face. As the quality of the nap produced depends largely upon the amount and quality of the felt the cloth contains, the fulling must be considered. It is important that the nap should be sufficiently dense to cover all trace of the weave, otherwise there will be a "grayness" that is objectionable. Hence there should be a close felt from which to raise a suitable nap. This means a slow fulling and a suitable percentage of shrinkage in length.

With the variations in weight from the loom and variable conditions incident to fulling, there is bound to be a difference in the amount of felt, so that some pieces will require more napping than others. If this is not taken into account there is bound to be a variation in the quality of the luster. The deduction drawn from the appearance and condition of the samples above referred to was that the finisher had been doing his napping too much by rule, or that he was not sufficiently skilled in his work. There is a tendency to do the work by rule where the modern napper is used. This was not the case with the teasle gig. In a mill that once produced the best luster finished goods in this country, the finisher ran the cloth by a certain system of rules on his double cylinder gigs, and then transferred them to a single cylinder machine, where he brought them gradually to uniformity that insured an excellent luster. This uniformity may be secured by having a finishing gig complete the work after being run on the napper. It is not so easy to make the fine discriminations necessary where the work is all done on the napper.

Upon goods sufficiently light for women's wear, it is necessary to utilize all the felt upon the face of the cloth to produce a suitable and uniform nap, I have known of finishers who were wary about the napping, for fear of getting the goods tender. While this is commendable, it discloses a lack of skill, of being in doubt about how far to go and when to stop. If the stock and construction is suitable, there should be no danger on this point. If the attempt is made to put a broadcloth finish on a filling face cloth or a fabric that cannot be sufficiently felted, it is a more difficult undertaking and not satisfactory in the end By going through the retail market one will find many so-called broadcloths that are not entitled to the name. A steam finish given to a plain weave or a cloth devoid of nap does not possess characteristics of a broadcloth and cannot stand the required napping that a strictly warp face and well felted cloth can. The writer was once called upon to give a steam finish to a cotton warp casket cloth, only ten ounces in weight, woven with a filling face. The selling agent said, "Get a good luster and never mind the strength, for the party that wears it will never kick about it."

In the finishing of kerseys, that have more body of felt, it is sometimes possible to work up a suitable nap without going so close to the weave. With a light weight broadcloth it is necessary to convert all the fibers composing the face felt into a nap, otherwise the bottom felt will be a detriment to the best results. This was the case with the samples above referred to. Some of the pieces had the face fibers at the bottom of the felt still in their tangled state, which resulted in a poor luster in proportion to the lack of napping effect. This tangled effect not only showed through to the face but prevented a permanent set of the finish in steaming.

TESTING ANILINE OIL AND SALT

BY DR. LOUIS J. MATOS

Aniline oil and aniline salt from various sources are not improbable in the near future, and it is also likely that differences in grade—not necessarily in quality—will for some time be the rule, for it must be remembered that commercial aniline oil is not exactly a substance of definite composition, but varies considerably, and according to such variations is suited or unsuited for certain specific purposes.

The bulk of the aniline oil or salt used in the textile industry is for either hosiery dyeing or cotton goods padding or printing, and for these purposes, if to be used to the best advantage, should have properties close to the approved standard, which, in the case of the oil, should be a boiling point of 182° C. at which temperature 90 per cent. of the oil should distil. It should have a specific gravity of 1.027 at 15° C. and should not show indications of either nitro-benzol or other nitro bodies or of hydro-carbons upon treating a sample with dilute hydrochloric acid.

Aniline oils of commerce are broadly divided into four kinds: (a) Aniline oil for blue, the one most used by cotton dyers and calico printers; (b) Aniline for red; (c) Aniline for safranine; (d) Toluidine. While for the purposes of the dye house and print works, the three latter are not to be considered, their existence should be borne in mind, as they are likely to be encountered when the domestic anilines will be on the market.

Aniline oil is tested and graded according to the results of a laboratory distillation, which is carried out in an apparatus shown at Fig. 1. The complete apparatus consists of a "ring stand" and a piece of wire gauze to support the distilling flask, a Bunsen burner, several 200 cc Lunge distillation flasks, a thermometer, a funnel for use in filling the flasks, an 18 or 20 inch condenser, and a 100 cc measuring cylinder. The distilling operation is very simple. One hundred cubic centimeters of the sample of aniline oil is put in the dry flask with the aid of a funnel, and the several parts of the apparatus connected as shown, finally inserting the thermometer. When all is ready, the cool water is slowly admitted from a tap to the condenser and allowed to flow away at the rate of about one quart every 5 or 10 minutes. Heat is now applied, gently at first, until the contents of the flask begin to boil, at the same time carefully observing the temperature, and noting the volume of

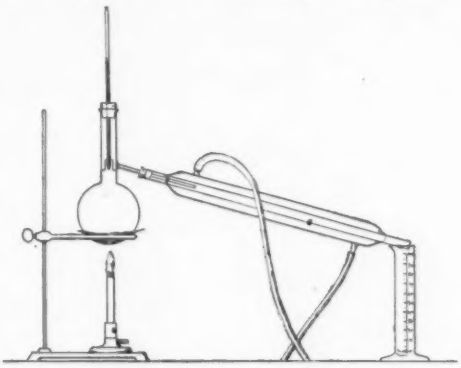


FIG. 1. APPARATUS FOR DISTILLING ANILINE

distillate that collects in the cylinder. Aniline in every way suitable for use of the "black dyer" should distil over in about the following proportions:

Below 180° C.	5 ccs.
Between 180° and 185° C.	92 ccs.
Between 185° and 190° C.	3 ccs.

What remains in the retort or flask is a higher boiling fraction consisting chiefly of toluidine, which does not, in the small quantity present, affect the aniline for the purpose intended.

For an aniline of specific gravity of 1.027 sharp, 90 cubic centimeters should have distilled with the thermometer standing at 182.5° C.

The specific gravity of aniline oil is determined at a uniform temperature of 15° C. (60° F.) by means of a Westphal balance, Fig. 2, an instrument of great utility in determining accurately the specific gravity of liquids, and which should be used in mills that presume to exercise control over supplies.

The specific gravity is ascertained by

nearly filling the cylinder with aniline, putting in the float suspended from the end of the arm of the balance, and adding the wire weights until the arm is in perfect balance. Aniline oil for black dyeing should mark 1.027 and never below 1.0265, while any samples of higher gravities show the possible presence of toluidine or of unchanged nitrobenzol, and for that reason they should be rejected.

Impurities are detected by dissolving 10 ccs of the sample in 10 ccs of hydrochloric acid, and diluting with water to 100 ccs. Turbidity is proof of the presence of nitro-

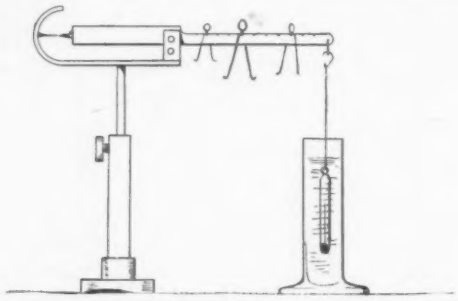


FIG. 2. SPECIFIC GRAVITY BALANCE FOR ANILINE

benzol, etc., and should be given attention.

Aniline salt should be in the form of large, well formed crystals, a condition indicating that they have been made from a good, prime quality of aniline oil. If they are small and powdery, the oil used in their manufacture consisted chiefly of toluidine and they should not be accepted.

Moisture in aniline salt is determined by drying a weighed portion in a dessicator for 24 hours over oil of vitriol, and weighing again to ascertain the loss.

Free acid in aniline salt is the most important substance to determine, for the reason that most of the damage done in aniline black printing is the result of the presence of free acid. The test is made by dissolving 5 grams of the sample in 10 ccs of distilled water, and to this solution is added 5 drops of a 1 to 1000 solution of Crystal Violet, and the change of color noted against a parallel test made with a sample of aniline salt of known purity. If the color of the sample is bluer than that of the type, it is titrated with a deci-normal solution of aniline until the color of the two solutions is the same. The amount of aniline solution required corresponds to the amount of free acid present in the sample under investigation.

The color of aniline oil is no criterion as to its usefulness for either dyeing or printing. All commercial aniline oils when freshly distilled are water white, but gradually become darker on account of the presence of traces of certain sulphur compounds that they contain. As the oil of the near future is not likely to remain stored for any length of time, much discoloration will not be noticed.

On the other hand, discolored aniline salt should be rejected. Much has been sold in the past that was of a distinct greenish-black color, showing at once that it had not been properly protected from the atmosphere. While no very serious harm can come from such salt, yet its use is not to be recommended. Whatever is delivered to the mill should be fresh and bright looking, large clear crystals, but at the same time paying due regard to the presence of free acid.

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SHRINKING COTTON GOODS

Editor Textile World Record:

Is there a process for shrinking cotton goods, both woven and knit, without injury to the articles treated? Socrates (2451).

Prolonged boiling in an alkaline soap solution causes cottons to shrink to a degree partly determined by the twist in the yarn and the thread-structure of the fabric; the effective agent being the excess of alkali in the soap. Any of the common alkalies, soda ash, silicate of soda or caustic soda can be used and the last-named is employed most generally. In some conditions it may be best to use with them soap or some other emollient such as aniline oil. To avoid injury to the goods the important thing is to wash out and neutralize the alkali. If a proportion of caustic soda is left in the fabric there is a liability that the goods will turn brown or even rot. Palpably—as in mercerizing when very strong caustic soda is used at a low temperature—goods can be quickly shrunk, with the

effect of appreciably increasing their tensile strength and their affinity for colors, but the reagent must be washed out and neutralized.

It was lately announced by Prof. E. Knecht that hydrochloric acid in an uncommercial strength could be used in replacement of alkalies in shrinking cotton. The acid should be of 37°-38° Tw. and immersion for thirty seconds brings about great shrinkage without tendering or deteriorating the fiber. An advantage is that the acid can be completely washed out in a minimum of time and solutions this strength could be made cheaply on demand. Wessex.

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A NEW FAST BLACK.

The Liberty Dyeworks, of Reading, Pa., who have developed the invention of Edward Schulze for a new fast black dye, announce that they expect to supply medium quantities to the trade within a short time and will extend their facilities so as to supply material on a larger scale very shortly.

Dye Recipes

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 230

BLUE ON LADIES' DRESS GOODS

Blue on 100 lbs. ladies' dress goods. Prepare dye bath containing

1 lb., 3⅗ ozs. Amazo Brill. Blue G.
1 lb., 9⅗ ozs. Amazo Brill. Blue R.
1 lb. Amazo Blue.
(American Dyewood Company, 80 Maiden Lane, New York City, N. Y.)
20 lbs. Glauber's Salt.
3 lbs. Oil of Vitriol.

Enter at 120° F., raise to boil and boil 1 hour. Rinse.

The above colors are recommended for their good leveling properties and fastness to light.

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Recipe No. 231

SAND ON LADIES' DRESS GOODS

Sand on 100 lbs. ladies' dress goods. Prepare dye bath containing

126 grs. Amazo Brill. Blue R.
192 grs. Amazo Brill. Red 2B.
(American Dyewood Co., 80 Maiden Lane, New York City, N. Y.)
420 grs. Amazo Fast Yellow LR.
15 lbs. Glauber's Salt.
1½ lbs. Oil of Vitriol.

Enter goods at 120° F., raise to a boil in 1/2 hour. Boil for 3/4 hour. Rinse.

The colors used in the above shade are recommended for dyeing by the acid method because of their good leveling properties and their satisfactory fastness to light.

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Recipe No. 232

GREEN ON COTTON YARN

Columbia Green B on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Columbia Green B.
(Berlin Aniline Works, 213 Water St., New York.)
20 lbs. Glauber's Salt.

Enter at 180° F. and dye for 1 hour at 200° F.

Columbia Green B possesses the characteristic properties of the direct cotton colors.

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Recipe No. 233

YELLOW ON WORSTED YARN

Wool Fast Yellow 5 G on 100 lbs. worsted yarn. Prepare the dye bath with

1 lb. Wool Fast Yellow 5 G X.
(Badische Co., 86 Federal St., Boston, Mass.)
15 lbs. Glauber's Salt.
4 lbs. Acetic Acid.

Enter at 160° F. and dye at a boil for 1 hour.

Wool Fast Yellow 5 G X possesses excellent coloring power and brilliancy.

—÷—

Recipe No. 234

BLUE ON COTTON YARN

Sulfur Blue R on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Sulfur Blue R.
(Berlin Aniline Works, 213 Water St., New York.)
20 lbs. Sodium Sulfide Crys.
5 lbs. Soda Ash.
50 lbs. Glauber's Salt Crvs.

First add the soda ash to the bath at 140° F. Then add the dvestuff previously dissolved with the sodium sulphide and finally the salt. Dye for about 1 hour at a temperature of 120° to 140° F. After dyeing squeeze well, allow to hang in air for 1/2 hour, wash soap and dry.

Sulfur Blue R possesses good fastness to light, Washing, alkalies and acids.

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Recipe No. 235

RED ON WORSTED YARN

Acid Chrome Red B on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Acid Chrome Red B.
(The Bayer Co., 117 Hudson St., New York.)
10 lbs. Glauber's Salt.
3 lbs. Acetic Acid.

Enter at 140° F., raise slowly to a boil, boil 3/4 hour, then add

3 lbs. Sulphuric Acid

and boil 15 minutes longer.

Finally after chrome at a boil for 30 to 40 minutes in a bath made up with

1½ lbs. Potassium Bichromate.

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Recipe No. 236

BROWN ON COTTON YARN

Katigen Dark Brown B on 100 lbs. cotton yarn. Prepare the dye bath with

12 lbs. Katigen Dark Brown B.
(The Bayer Co., 117 Hudson St., Boston, Mass.)
12 lbs. Sodium Sulphide, Conc.
8 lbs. Soda Ash.
80 lbs. Glauber's Salt, Crystals,

adding the dissolved color to the bath which has already been prepared with the soda ash, and finally adding the salt.

Katigen Dark Brown B possesses very good fastness to light and washing.

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Recipe No. 237

ORANGE ON COTTON YARN

Naphtamine Orange 2 R on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Naphtamine Orange 2 R.
(Kalle Color & Chemical Co., 530 Canal St., New York.)
25 lbs. Common Salt.

Dye at a boil for 1 hour.

Naphtamine Orange 2 R possesses the characteristic properties of the direct cotton colors.

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Recipe No. 238

VIOLET ON WORSTED YARN

Acid Violet 4 B C on 100 lbs. worsted yarn. Prepare the dye bath with

1¼ lbs. Acid Violet 4 B C.
(Badische Co., 86 Federal St., Boston, Mass.)
15 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 160° F. and dye at a boil for 1 hour.

Acid Violet 4 B C gives a very brilliant violet of good fastness.

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Recipe No. 239

BLUE ON COTTON YARN

Naphtamine Brilliant Blue B on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Naphtamine Brilliant Blue B.
(Kalle Color & Chemical Co., 530 Canal St., Boston, Mass.)
30 lbs. Common Salt.

Dye at a boil for 1 hour.

Naphtamine Brilliant Blue B possesses high coloring power and excellent brilliancy for a direct cotton color.

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Recipe No. 240

BLUE BLACK ON WORSTED YARN

Naphtol Blue Black on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Naphtol Blue Black.
(Cassella Color Co., 182 Front St., New York.)
10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid, added slowly.

Enter at 120° F. and dye at a boil for 1 hour.

Naphtol Blue Black possesses good fastness to light.

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Recipe No. 241

GREEN ON WORSTED YARN

Brilliant Milling Green B on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Brilliant Milling Green B.
(Cassella Color Co., 182 Front St., New York.)
10 lbs. Glauber's Salt, Crystals.
5 lbs. Acetic Acid.

Enter at 110° to 120° F. and bring to a boil in about 40 minutes, dye at a boil for 40 minutes and then gradually add

5 lbs. Acetic Acid

to exhaust the color, continuing the boiling 15 minutes longer.

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The imports of wool into Canada from the United States during the month of January, 1915, amounted to 760,295 pounds valued at $227,101, as compared with 89,607 pounds valued at $23,539 during January, 1914.

New Machinery and Processes

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to the textile manufacturers. It is not a list of patents but of improvements on the market, the idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

Whenever possible we endeavor to make a personal investigation of the new machinery and processes described in this department. In the absence of such personal investigation we must necessarily rely upon information obtained from those who control the machines and processes.

We invite machine builders and others to send us such information for this department.

Textile Parchment. The Diamond State Fiber Co., Bridgeport, Pa., is now successfully making and has placed on the market "Textile Parchment" or "Filature Parchment" which has hitherto been made exclusively in France and Germany. Since these markets have been closed there has been a large demand which this company is now able to fill. This is a thin material used in spinning mills for covering rollers and other purposes. It is light pink in color and very tough.

Spring Needle Rib Machine for Underwear. The Crane Manufacturing Co., Lakeport, N. H., have placed on the market an improved model spring needle rib machine which contains a number of improvements. A description of this machine will be found in another part of this issue.

Regulating the Tension of Skeins. The John H. Giles Dyeing Machine Co., Taunton, Mass., are placing on the market a device for regulating the tension of the skeins on their improved skein dyeing machine. A description appears in this issue.

Sewing Machine for Inserting and Sewing Elastic Tape. The Metropolitan Sewing Machine Co., Nyack, N. Y., are placing on the market a special machine which in one operation does the hemming, stitching, inserting and guiding elastic tape for garments. A description appears in this issue.

Woven Belt Loom. Robert Hall & Sons, Bury, England, are placing on the market a loom to weave belts of from 1 to 12 inches in width and of from 2-ply to 8-ply in thickness. The loom is worked on the under-pick principle.

An Improved Roller for Yarn and Cloth. Henry Caley, Failsworth, Manchester, England, has recently brought out a wood roller of improved construction for winding cloth and yarn. It consists of three segments which when put together form a cylinder with a triangular aperture running through the center into which the shaft is inserted. The shaft is triangular for that portion that lies inside the roller and is made round outside the roller in order to fit the bearings.

Core Yarn. Paul Simons, Cottbus, Germany. An attachment for making yarn having a central core surrounded with a coating of another fiber.

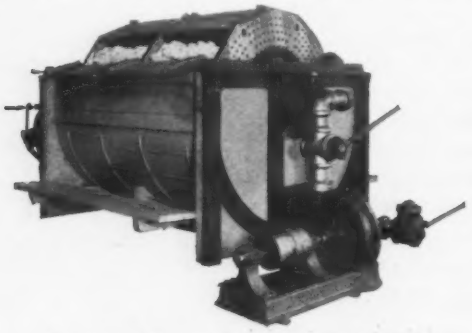
Cotton Waste Machine. J. Hetherington & Sons, Ltd., Vulcan Works, Manchester, England, A. S. Fuller, 35 Federal St., Boston, Mass., being the American agent, are placing on the market an opening and cleaning machine for cotton waste. The material is laid on a lattice feeder and the quantity required by the machine is taken in at intervals. The waste on entering the machine encounters a spiked cylinder, over which work three spiked rollers. There is also a spiked rail at the back and a set of grid-bars fixed underneath the cylinder, through which bars the dirt is drawn by means of a revolving fan.

Tank for Circulating Dyeing Liquor. Vorwerk & Co., Barmen, Germany, have recently brought out a tank for circulating dyeing and other solutions through textile materials. The tank is balanced on a pivot in the center and tipped first one way and then another by mechanical means, thus causing the liquor to circulate through the material.

"HURRICANE" ROTARY-CIRCULATING MACHINE FOR BLEACHING AND DYEING

In the latest "Hurricane" rotary-circulating machine recently placed on the market several new features have been embodied, and better work and quicker results are obtained.

The inside revolving cylinder is subdivided into a number of pockets, which have perforated doors, partitions and end walls. Through the centre of the cylinder, there extends a perforated supply pipe, through which the liquor is forced by means of a



"HURRICANE" ROTARY-CIRCULATING DYEING MACHINE FOR RAW STOCK, HOSIERY, ETC.

pump located on the outside of the machine. In the bottom of the tub, there is also a perforated return pipe, the latter being connected, also, to the pump.

By the proper arrangement of valves and pipe connections, the liquor may be forced from the interior of the revolving cylinder, through the mass of material contained in the various pockets, and then returned back into the pump, and circulated over and over again,—the flow being from the centre of the mass toward the outside.

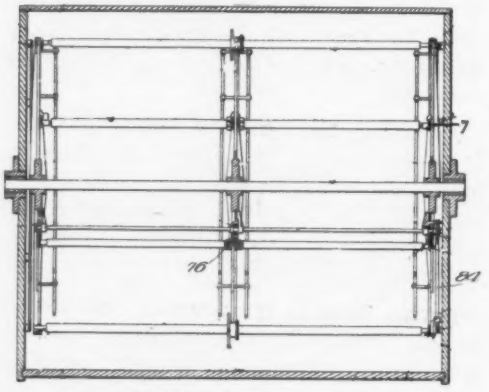
When desired, by changing the valves, a circulation in the reverse direction is secured, that is, from the circumference of the cylinder toward the centre. By forcing the liquor for the desired length of time, first in one direction, and then in the opposite direction, through the pockets full of material, uniformity and more rapid results are obtained than in the older styles of machines which did not have this improved feature of positive circulation of the liquor.

Machines of this type have been installed with splendid results for handling both raw stock and hosiery. On account of the positive circulation of the liquor, it has been found possible to do the boiling, bleaching or dyeing, and also the soaping and washing of the material entirely in the machine, and without removing the goods, thus saving a great deal of handling and considerably reducing the cost of production.

The machines are built in various sizes, with cylinders made of wood, iron, bronze, or special metals, according to requirements by the Philadelphia Drying Machinery Company, 6721 Germantown Ave., Philadelphia, Pa.

IMPROVED TENSION DEVICE FOR THE GILES DYEING MACHINE

A patent has recently been issued for a device used for regulating the tension of the skeins on the Giles improved skein dyeing machine, built by the John H. Giles Dyeing Machine Co., Taunton, Mass. This device enables the machine operator to change the



VERTICAL LONGITUDINAL SECTION OF THE GILES DYEING MACHINE

tension on the skeins after the yarn has been loaded into the machines and while the boiling is going on. The adjustment on a double machine can be made in five seconds, whereas formerly it took ten minutes to do the same work. Moreover if the dye liquor had been put into the machine it was undesirable to change the tension, as the stoppage for ten minutes would often times seri-

ously effect the shade, causing unevenness of color. If the change was not made tangled or matted yarns would frequently result.

The inner stick bearing rings are rotatively supported on the spiders, while the outer bearing rings are rigidly supported on the spindles. The bearings upon which the inner stick bearing rings, 7, turn are provided as shown by the ends of the inner reinforcing ribs of the spokes. Suitable clips on the spokes engage the outer edges of the rings to hold them in position. The two inner bearing rings at the center of the double type of machine are secured together by bolts so that they will turn together thus forming a double bearing ring.

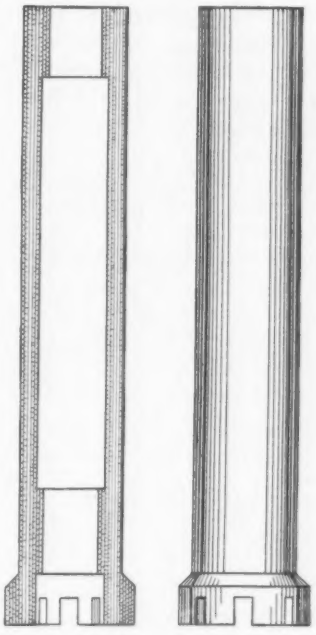
For turning, the rings are provided on their inner peripheries with racks or toothed segments, 76. Engaging the teeth of these racks are pinions carried on a longitudinally arranged shaft which is journaled in suitable bearing brackets carried on the spokes. A worm gear is provided on the end of the shaft whereby it is turned to shift the bearing rings, 7, through the engagement of the pinions and racks and thus shift the entire series of inner stick bearings and the sticks in unison. To effect this movement conveniently there is provided a radically arranged actuating shaft, 84, journaled in suitable brackets on the spokes and the outer ring. Upon the actuating shaft is arranged a worm in engagement with the worm gear. The outer end of the actuating shaft, 84, is squared for the engagement of a suitable detachable operating wrench by the operation of which all of the inner bearing rings and sticks are moved together with relation to the outer yarn sticks. The arrangement described adjusts all of the bearings in one operation and the use of the detachable wrench affords a cool handle for the operator.

Massachusetts, with 1,347,778 bales, leads all the other states in the quantity of cotton consumed; North Carolina, with 906,177 bales, is second; South Carolina, with 794,678 bales, third; and Georgia, with 632,332 bales, fourth.

PAPER BOBBINS

A line of paper speeder bobbins is being introduced by The American Paper Bobbin Co., Inc., 670 Eddy St., Providence, R. I. They are claimed to possess many advantages over speeders and slubbers made from wood. After a great deal of experiment the process of manufacture as well as the right kind of material has been worked out satisfactorily.

They are made in any size desired, and are claimed neither to split nor chip, thus doing away with the extra charges for rings or shields which are often used to prevent chip-



PAPER SPEEDER BOBBINS

ping and splitting. Neither will they swell, shrink or warp, as they are immune to all atmospheric conditions, and in consequence are, therefore, accurate in size at all times. Another claim which is made is that they will not absorb oil thus ensuring clean yarn free from spots.

Already about sixty mills are using them, and very satisfactory reports have been received. Samples are furnished free upon request.

The American Paper Bobbin Co., Inc., was

formerly the American Textile Specialty Machinery Co., well known in the trade.

TESTS FOR TIRE FABRICS

The lack of standard specifications and dependable methods and apparatus for making tests has probably been more keenly felt by the manufacturers and users of tire fabrics than by any other branch of the business, except possibly in the bag trade where cement manufacturers are very much interested in having some standard rules for testing cement bags requiring a cheap, but strong fabric. The American Society for Testing Materials recently appointed a committee to prepare specifications and at their recent meeting in Atlantic City the specifications given below were presented by the members of the textile committee comprised of the following gentlemen:

Mr. Abrams, Chicago, Atlas Cement Co., Northampton, Pa.; E. H. Barker, Lowell Textile School, Boston, Mass.; A. F. Bemis, Bemis Bros. Bag Co., Boston, Mass.; Roy Dallis, Elm City Cotton Mills, La Grange, Ga.; Frederic Dannerth, Hartford, Conn.; O. B. Finckel, J. H. Lane & Co., New York City; W. D. Hartshorne, Methuen, Mass.; Horace Jacquith, 11 Thomas St., New York City; W. S. Lewis, Bureau of Standards, Washington, D. C.; P. W. Litcheld, Goodyear Tire & Rubber Co., Akron, O.; Arthur D. Little, chemist, Boston, Mass.; E. H. Marble, Curtis & Marble Machine Co., Worcester, Mass.; Kenneth Moller, Jenckes Spinning Co., Pawtucket, R. I.; N. W. Sayles, Republic Rubber Co., Youngstown, O.; H. V. R. Scheel, Brighton Mills, Passaic, N. J.; Henry L. Scott, Providence, R. I.; A. A. Somerville, United States Rubber Co., New York City; F. P. Radcliffe, Philadelphia, Pa.; Gordon Wilson, Universal Portland Cement Co., Chicago, Ill.; D. E. Doutv. United States Conditioning and Testing Co., 340 Hudson St., New York City.

SPECIFICATIONS

1. For the determination of tensile strength a 10-inch swatch, the width of the cloth, shall be taken from either end of the roll, and the test specimens cut from it and tested as specified later. If by the first tests the fabric fails to meet the specifications a second swatch shall be taken as follows:

If the roll is a complete warp, the second swatch shall be cut from the center of the roll. If the roll is a part warp the second swatch shall be taken not less than 1 1/2 yards from the other end.

PREPARATION OF SPECIMENS

2. The test specimens shall be taken as follows: Starting at a line in the center, warpwise, lay off adjacent to this line five specimens on one side, parallel to the line (warp) and five specimens on the other side perpendicular to the line (filling).

The test specimens shall be cut 8 inches long by 2 inches wide, and shall be raveled to the specified number of threads per inch by removing approximately an equal number of threads from each side of the required width.

The test specimens shall be placed in a ventilated drying oven maintained at a temperature of 105° to 110° C. (221° to 230° F.) and dried to constant weight as determined by two consecutive weighings not less than 10 minutes apart, and showing a further loss of not more than 0.1 per cent. of the previous weighing.

TENSION TESTS

3. (a) One test specimen shall be taken (at one time) from the drying oven and immediately securely clamped in the two jaws of the machine, care being taken to see that the threads being tested are parallel to the direction of the pull and the cross threads are perpendicular to the line of pull.

(b) The breaking stress should be obtained within 30 seconds after taking a specimen from the oven.

(c) The length of test specimen between the jaws or clamps of the testing machine shall be 3 inches and the pulling jaw should travel at a uniform rate of 12 inches per minute.

(d) All jaws or clamps shall be at least 2 inches wide.

(e) The average results of tests should be reported separately for warp and filling.

ELONGATION OR STRETCH

(4) The elongation or stretch at breaking shall be determined as follows: Draw two parallel lines 3 inches apart[1] upon the test specimen, previous to placing it in the drying oven as it lies flat without tension upon a smooth surface. By suitable means measure the distance between these lines at the instant of breakage. The increase in length of the 3-inch portion shall be the elongation and may be expressed either in units of length or as the percentage of 3 inches.

WEIGHT OF THE FABRIC

5. The weight of the faric per square yard shall be based upon the weight and length of a complete roll and may be expressed either as (a) the weight dry, or (b) the standard weight, that is, the weight dry, increased by the standard moisture allowance of 8.5 per cent.

6. All covering and binding material shall be removed and the net weight of the roll quickly determined. A sample for the moisture test (described in Section 7) shall be taken immediately. The length of the roll and the width (described later) shall be determined quickly and accurately. As soon as the inner end is reached, a second moisture sample shall be taken.

MOISTURE CONTENT

7. For the determination of the moisture content two test specimens of approximately equal area, the combined weight of which shall be at least 3.5 ounces[2] (100 g.) shall be taken as described in Section 6, one from each end of the

roll, placed in a dry, air-tight container, the weight of which has been previously determined, carefully weighed therein, then removed (a check weighing being made on the container), the net weight calculated and the sample dried to constant weight in the same manner as described for the tensile strength. The difference between the original net weight of the sample and its dry weight is the loss of moisture. The percentage that this loss is of the original weight shall be considered the percentage moisture content of the roll.

DRY WEIGHT OF ROLL

8. The net weight of the roll, less that weight multiplied by the percentage moisture content found by the test, divided by 100, shall be considered the dry weight of the roll.

The dry weight of the roll may also be computed from the moisture test by the following proportion:

Net weight of sample ÷ Dry weight of samples = Net weight of roll ÷ Dry weight of roll.

For condition (a):

Dry weight per sq. yd. = Dry weight of roll ÷ Area of roll in sq. yds.

For condition (b):

Standard weight per sq. yd. = (Dry weight of roll + 8½ per cent. of dry weight) ÷ Area of roll in square yards.

WIDTH OF SAMPLE

9. The width shall be determined at five different places uniformly distributed along the full length of the roll and may be determined at the same time as the total length.

The average of the five measurements shall be the width.

NUMBER OF THREADS PER INCH

10. The number of threads per inch or count of the fabric shall be determined by counting a space of 10 inches in at least five different places in the roll. The average of the five determinations shall be the count.

[1] These lines should be sharp and distinct. They may be quickly, conveniently and accurately made with a die, inked by means of an ordinary stamp pad. The die may consist of two metal strips set crosswise of the grain into a well-seasoned block of hard wood, the inner faces milled accurately parallel and 3 inches apart and the outer faces ground away so as to form a fine, but non-cutting edge. A die entirely of metal would of course be superior.

[2] For a fabric weighing 17 1/4 ozs. per sq. yd., at least 260 sq. in., 130 sq. in. from each end, would be required. It is not necessary that each of these test specimens be a continuous piece, but a strip 2.5 to 3 in. wide cut the entire width of a 60-in. fabric forms a convenient and representative sample because it contains portions of both the ends and the middle of the roll. If for other purposes of comparison it is desired to have the specimens of definite shape or aliquot parts of a square yard such as 9 or 16 or 24 sq. in., they may be conveniently cut with a sharp-edged circular die pressed upon a smooth but not too-hard surface such as block tin or sheet lead. Equal total areas could in this manner be readily taken from each end of the roll. Care should be exercised to handle the moisture specimen as little as possible, preferably with the hands covered by some type of dry- non-absorbent gloves and to place them in the air-tight weighing container immediately.

These specifications are not intended to be final, but were tentatively adopted with the idea that after being in practical use for a year they should then come up for consideration and amendment before becoming the absolute standards of the associations. It is quite probable that some changes will be made before the final acceptance as standards and any suggestions or criticisms are invited to be sent to W. D. Hartshorne, Methuen, Mass. In the meantime during the coming year these specifications will doubtless be accepted throughout the trade for general use.

In this connection it is timely to note the recent completion of a new tire fabric testing machine which has been developed after much study and experiment by Henry L. Scott & Co., Providence, R. I. The illustration shows this perfected machine which conforms with the tentative specifications above. Several of these machines have already been delivered to manufacturers and users of tire fabrics and have given perfect satisfaction. The American Society does not give its final endorsement or recognition to any make of machine, but as the tests prescribed by the specifications above can all be determined by this machine it will be of interest to manufacturers and users of such goods, as the accuracy of the Scott testing machines is generally recognized and their tests are recognized by three Governments, including the United States.

The tester is a dead weight machine and is power driven. It is of horizontal design and is substantially and practically constructed. The rigid skeleton steel frame leaves all parts in full view and easily accessible. Every piece of the machine is built on United States standards and interchangeable.

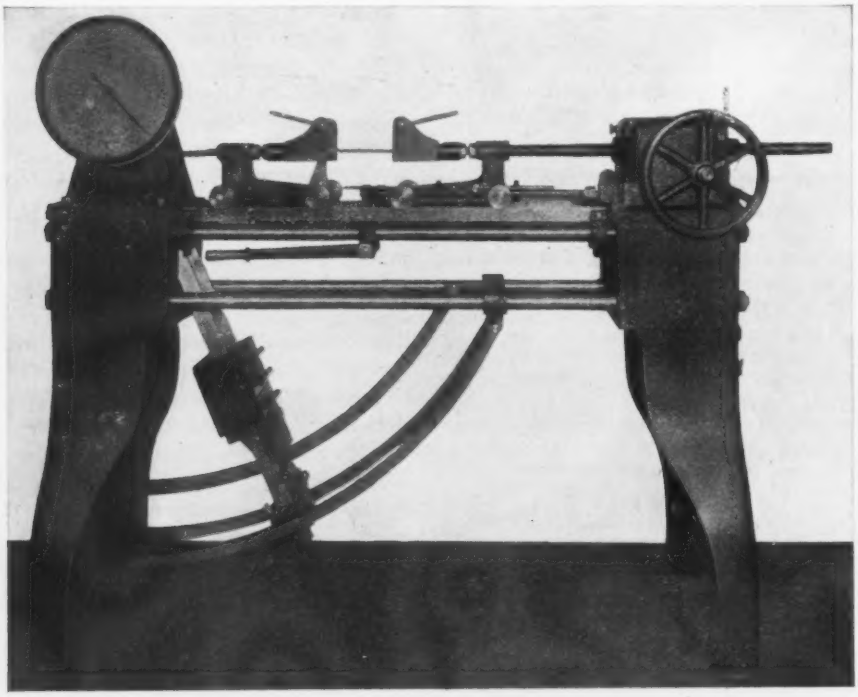
The stretch is obtained through a heavy steel screw at the rate of 12 inches per minute, reversing automatically, returning at

a speed of 36 inches per minute. The length of stroke and distance between clamps is easily adjusted at the will of the operator. The machine is controlled by a single lever at the front which enables the operator to stand squarely before the dial and start, stop or reverse the machine at will. The machine may be driven by a 1/4 h. p. motor placed upon the floor beneath it and the power transmitted by one 1 inch flat leather belt. The pointer remains at the position of the break until reset by the operator. The resetting of the weight lever requires very little strength, as a long lever is provided at the head end of the machine which makes its operation very simple.

The resetting mechanism is so constructed that it is entirely disengaged from all working parts of the machine during the test. This eliminates all friction and undue strain. Weight levers are suspended from splendidly constructed, self-aligning, hardened, steel ball bearings which are enclosed in dust-proof casings. The head carriage is ball bearing and is nicely counter-balanced.

This machine can be built to any capacity desired up to 2,000 pounds. The resistance weights are made in sections and are easily removed from the weight lever. Two rows of graduations can be provided on the dial and by removing part of the weights a light and delicate machine can be obtained for tests on light material.

Any style of clamp desired can be provided with the machine. The illustration shows a new patented, automatic, flat grip clamp recently developed by this company. Henry L. Scott & Co. also announce that they have recently obtained permission to use the special clamps recently developed by the United States Rubber Co. on their machines. They are prepared to furnish several styles of fabric clamps.



THE NEW SCOTT TIRE FABRIC TESTING MACHINE

Henry L. Scott & Co. was established in 1899 and are now giving their entire time and factory facilities to the manufacture of testing machines. Five departments of the United States Government, as well as the French and Belgian Governments, are using their testers.

A NEW MACHINE FOR INSERTING AND SEWING ELASTIC TAPE

The Metropolitan Sewing Machine Co., Nyack, N. Y., has put on the market a special machine which in one operation does the hemming, stitching, inserting and guiding of the elastic tape for garments, such as knickerbockers and bloomers, which require elastic tapes at the waist band and at bottom of both legs. The machine has a capacity of from 50 to 60 dozen bloomers per day.

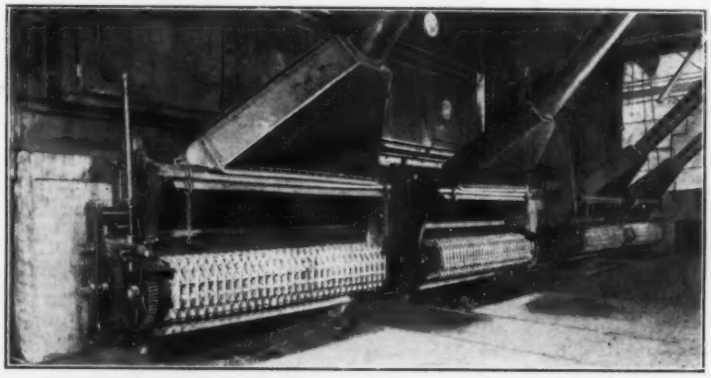
The machine is so arranged that the amount of elastic inserted is practically determined by the size of the garment being stitched, and the amount of gathering of the goods at the hem is determined and controlled by the mechanism for guiding the elastic strip, thus simplifying the operation and enabling a large production of uniform work with a neatly covered edge and the elastic securely fastened at the beginning and end of the stitching operation.

Another feature of the machine is that with its use the front portion of the garment, especially the waist band, is free from gathers and lies flat with the gathered portion at the sides and rear. The elastic band is in a normal position at the front where no gathers appear and is stitched at this portion to retain this position.

Goods of this character have been ordered to a considerable extent during the last few months for export, and the company has developed this machine on the request of one of the concerns which had been filling such orders. Several methods had previously been in use requiring much hand labor, proving slow and expensive. The elastic strip as used is far from being uniform in width, thickness and elasticity and when cut, as was formerly required, in predetermined lengths and made endless in loop form, a great difficulty was experienced in getting a uniform finish to the work. The new machine overcomes these objections and enables a much larger production to be obtained. It is protected by patents.

ELIMINATING SMOKE, SOOT AND DIRT IN STEAM GENERATION

Pittsburgh's annual "soot fall" is said to be 1,031 tons per square mile; the "soot fall" of Glasgow, 820 tons, London, 426 tons.



F.G. I. FOUR BOILERS EQUIPPED WITH GREEN CHAIN GRATES

These figures are quoted from the "1914 Report of the Mellon Institute of Industrial Research of Pittsburgh."

The question of how to eliminate objectionable smoke is one of the foremost problems now being faced by municipalities, and all cities are engaged in active campaigns in abating smoke.

The Green Engineering Co., East Chicago, Indiana, were pioneers in this class of engineering, starting nineteen years ago with the installation of the Green chain grate with furnaces suitable for smokelessness and complete combustion. They developed the chain grate with various standard furnaces

which have been extensively adopted and used. Green chain grates now serve over two million rated boiler horse power giving a high degree of economy as well as smokelessness. An idea of the appearance of a plant of four boilers equipped with Green chain grates, is shown in Fig. 1.

Chain grates were originally designed and developed in connection with free burning coals, but in recent years the "L" type, or coking coal chain grate has been designed and developed and it is now possible to burn the semi-bituminous and coking coals by the chain grate method. A cut of the "L" type caking coal chain grate is shown in Fig. 2.

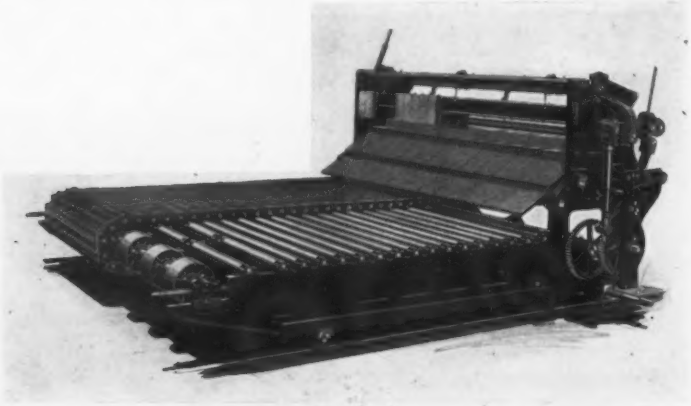


FIG. 2. THE "L" TYPE GREEN CHAIN GRATE STOKER FOR COKING COALS

One desirable feature of chain grates for either coking or free burning coal is that natural draft may usually be employed. This means freedom from cinders which are apt to be thrown from stacks with forced draft, and which are equally objectionable as smoke or soot.

Ash handling is everywhere an endless, unsatisfactory and usually a dusty task. The disposal of ashes without machinery is a continuous nuisance and an expense without any returns. Conveying machinery saves labor, but entails expense for replacement on account of wear. In either case ash disposal involves considerable ash re-handling, with shoveling to a barrel or box, trucking or transferring, hoisting or elevating, dumping on or into something, and then reshoveling into a wagon or car. All this effort is accompanied by dirt, dust, obnoxious steam and gases, and a fire hazard is always present. In power plants, large buildings or wherever ashes are handled, the unkept appearance of the premises, damage to decorations and exposed goods and the expense incurred in attempts to maintain reasonable cleanliness, are well recognized annoyances and sources of expense.

The Green Engineering Co. has developed the "Geco" steam jet system of ash handling. By this system ashes are raked into an opening in a pipe line at the point where ashes are produced and are instantly conveyed and deposited thoroughly quenched

FIG. 3. SHOWING THE CLEANNESS AND SIMPLICITY OF HANDLING ASHES

into a tank or bin ready for immediate loading by gravity into a car or wagon.

Suction for creating air flow through the conveyor pipe is produced by one or more steam jets placed in elbows in the pipe line or in straight runs of pipe between the ash intakes and points of discharge. The number and size of the jets depend on the rate that ashes are to be handled, the length of system and the steam pressure used.

The steam consumption per ton of ashes handled varies with the distances ashes are conveyed, the number of bends and turns in pipe line and the rate that ashes are to be handled. Systems up to 200 feet long are readily designed to carry 8 tons of ashes per hour, which is the limit of a man's capacity to hoe ashes to an intake. Depending on the cost of steam, the distance ashes are carried and the rate of handling, the cost of steam for handling ashes is from three to five cents per ton. In plants where steam required might tax the available steam capacity, ashes are handled at periods when the load is off. In many plants blowing off of steam follows dropping of the load and ashes are handled at periods when the load is off. In many plants blowing off of steam follows dropping of the load and ashes are handled at such periods utilizing steam otherwise wasted.

In pneumatic ash conveying systems the separation of air and dust can only be effectively accomplished by spraying the ashes with water while in transit. Steam nozzles alone will partly quench the ashes, but water must be added to lay the dust. The Green Engineering Co. control the patented feature of injecting water into the ashes while in transit through the pipe.

The pipe lines of steam jet systems may be run at any angle, elevation or level. These systems may readily be adapted to any building construction or arrangement, and the ash storage tanks may be placed at a location most accessible for wagons or cars.

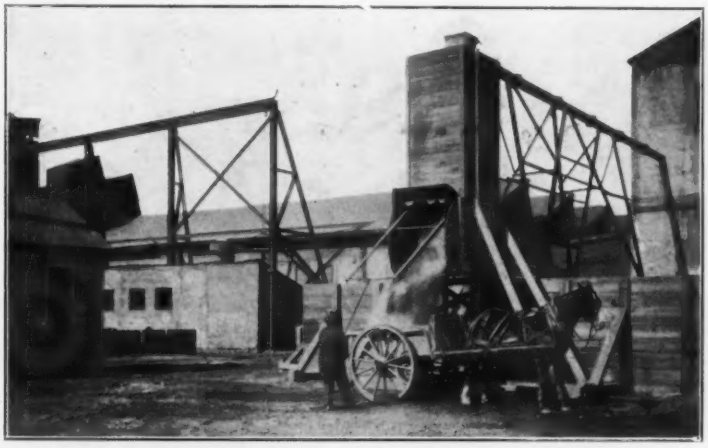


FIG. 4. ASH BIN EMPTYING

Fig. 3 shows the cleanness and simplicity of handling ashes with this system. Fig. 4 shows the ease with which the ashes are disposed of from the storage tank.

The entire system is operated by turning valves for steam and water. No machinery with moving and wearing parts is involved, and no aisles are blocked by trucking and the premises are free from dirt and hot gases.

Yellow berries, the fruit of a bush, Rhamnus tinctoria, which grows in the interior of Asia Minor, are annually exported in large quantities from Mersina to England, Germany, and other European countries for the preparation of a fine dye suitable for silks and other delicate fabrics.

A QUICK METHOD FOR TESTING THE NON-STAINING QUALITY OF TEXTILE OILS

BY THOMAS T. GRAY

All oils will spot white textile materials to a greater or less degree. Yellow oils, for illustration, will form yellow stains, and the depth of the color of these stains varies according to the color of the oil. If, therefore, oils of exceedingly light color are used, such spots become harder to distinguish, and if the oil is colorless, it is almost impossible to find where the cloth has been spotted by it. Such oils were, therefore, termed stainless textile oils, but it was found later that although these products were stainless at first, white goods which had become spotted by them slowly developed yellow-brown stains. The oil people, when confronted with this problem, usually advised their customers that oils could not be made stainless any more than mud could be made mudless, and that the safe way was to prevent the lubricants used from reaching the material.

COOPER HEWITT LABORATORY OUTFIT

A large corset manufacturer claimed to have lost several thousand dollars in a single year on account of stains developing weeks and even months after shipments had been made. The writer, when chief chemist of the Tide Water Oil Company, was confronted by this problem. We knew that hydrocarbon products exposed to sunlight would gradually darken in color; with this idea in mind we adopted a sunlight test by exposing pieces of white tape, which had been dipped in oil, and a piece of the dry tape to the sunlight for several weeks. It was found that color of the oil alone was not the most important characteristic, but that the method of manufacture played an important part. Several theories were set forth at the time to account for the cause of these stains; some Russian white oils, for illustration, did not develop stains on long exposure of sunlight, whereas some white oils made from American crude petroleum developed stains under the same conditions. Inasmuch as the Russian oil was practically bloomless and the American products had a pronounced bloom, the theory was advanced that the bloom was, in some way, connected with the staining properties; however, by experimentation, this theory was disproved.

The sunlight test required three to four weeks in order to get results, which was too long to be of practical service. It occurred to the writer that the cause of these stains was due to the oxidation of certain unsaturated hydrocarbons present in the oil, and it seems that test pieces exposed to the Cooper Hewitt Quartz Lamp, which is known to be rich in ultra violet light, would give a quick method for determining the quality of stainless oils. Test pieces of tape were prepared, using oils of known quality in comparison with other samples. These test pieces were placed six inches below the Cooper Hewitt quartz tube and allowed to remain for half an hour. Some oils which did not show stains in sunlight showed stains immediately under the ultra violet light. At the end of the test, the oil of known quality which was a Russian product, was unchanged, where some of the American white oils had formed yellow-brown stains. It was not only found possible to be assured of the quality of the products by this test, but it

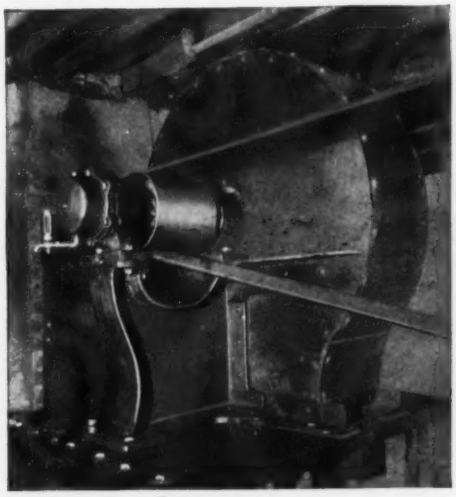
was of great value in developing a satisfactory method for manufacturing these products.

The test finally adopted was to expose test pieces of tape in comparison with an oil of known quality. The tapes were placed six inches below the lamp for thirty minutes.

FAN TROUBLE SOLVED BY BALL BEARINGS

BY FRED E. ROGERS, JR.

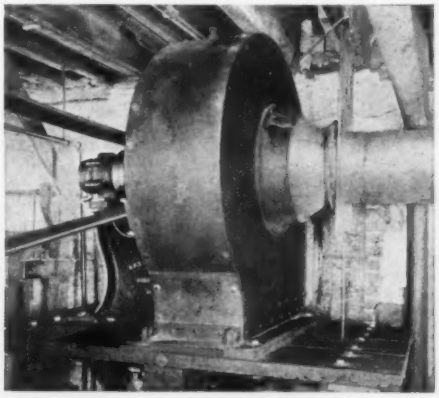
Because of the extraordinary nature of the service demanded of them, fans and blowers



EXHAUST FAN OF DOLPHIN JUTE MILLS EQUIPPED WITH S K F. SELF ALIGNING BALL BEARINGS

are subject to operating conditions seldom imposed on any other type of machinery. Often located near ceilings, in sub-basements and other out-of-the-way places where it is inconvenient to oil or inspect them, they are very easily overlooked. For this reason ball bearings, which require attention but three or four times a year, are particularly useful on this type of equipment.

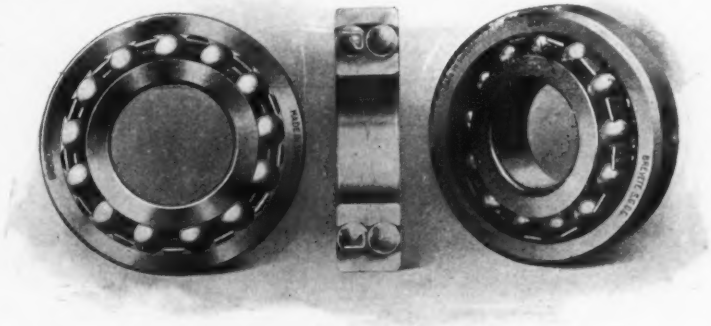
Plain bearings suffer from neglect. They must be carefully oiled and watched, as in-



INLET SIDE OF EXHAUST FAN

attention is likely to prove disastrous. Lack of oil and continuous running at high speed under heavy load frequently cause overheating with subsequent seizing of the bearing. Fires often have their origin in overheated bearings.

The Dolphin Jute Mills, of Paterson, N. J., found the substitution of S. K. F. Ball Bearings for the plain babbitt type a com-



TYPICAL S.K.F. RADIAL BEARING, SHOWN IN NORMAL POSITION, IN SECTION AND IN DEFLECTED POSITION

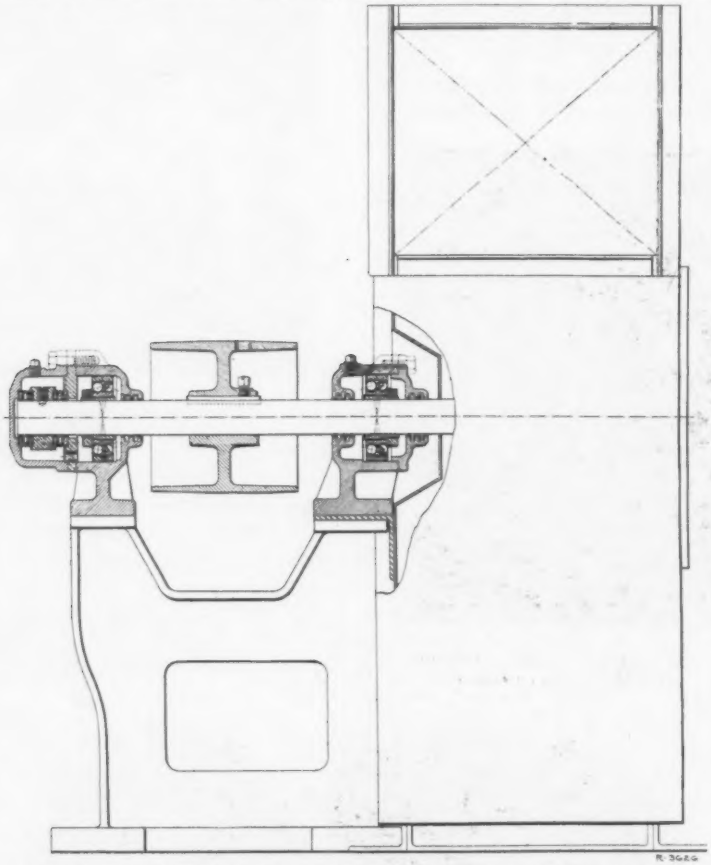
plete remedy for their fan troubles. They use a 48-inch exhauster to operate a waste removal system which transports jute

through a long pipe line. The fan is situated on a platform near the ceiling of a dusty, lint-covered loft.

The plain bearings gave no end of trouble. They were continually overheated, frequently becoming so hot that the babbitt melted and ran out. This, of course, crippled the system.

The installation of S. K. F. self aligning ball bearing boxes in the place of the plain bearings occasioned but slight inconvenience. Now the fan runs continuously 10 hours daily t 1,950 r. p. m., requiring no other attention than an oiling about every three months. A light grade of engine oil is used, a gauge glass showing the amount of oil in the bearing.

The accompanying illustrations show the method of installation. The driving pulley is located between the two bearings, the impeller being overhung. The thrust bearing which is required to take up the end thrust of the fan, is provided in the box farthest from the fan casing. The boxes are provided with felt packing rings which protect the bearings from dirt and lint and allow no lubricant to be wasted by leakage. Oil-soaked heaps of dust are therefore eliminated from around the fan.



SECTION THROUGH SHAFT SHOWING DETAILS OF BEARING ARRANGEMENT

Due to the self-aligning feature of S. K. F. bearings the weight of the overhung fan does not bind the bearing, a condition which is apt to occur with plain bearings. This self alignment is accomplished by grinding the outer race of the bearing in the form of a section of a hollow sphere whose center is

the center of the axis of rotation. Thus the balls and inner races are free to rotate at any angle within this spherical outer race, without subjecting the races to any undue strains.

In addition to removing all operating troubles and reducing the fire hazard, the use of ball bearings undoubtedly lowers to a very large extent the power wasted in friction.

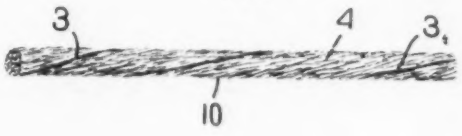
A MOHAIR FABRIC

An improved mohair fabric designed to resemble linen has recently been patented in this country. The inventor states that it can be manufactured at a lower cost and is stronger and more durable than the ordinary mohair fabric and is especially suited for summer clothing. He describes it as follows: Mohair contains fibers of two different characters, a white fiber with comparatively little life which will not take a dye readily, and another fiber with considerable life which will readily take the dye. The first-named white fiber that will not readily take the dye is known to the trade as kemp. The fibers are usually coarser than the other fibers.

In preparing yarn from mohair, it has heretofore been customary to subject the fibers to the combing process to an extent sufficient not only to take out the noil, but also to remove the so-called kemp while leaving in the top from which the yarn is spun the fibers which will readily take a dye. In thus continuing the combing operation to a point sufficient to remove the kemp, a considerable part of the other fibers which will readily take a dye are removed, so that a considerable per cent. of the original material of the Angora fleece is removed during the process of removing the kemp. This adds to the cost of mohair yarn.

The mohair yarn thus produced is used for the weft with specially prepared warp thread which cooperates with this mohair weft yarn to produce goods of an even texture. The presence of the kemp in the weft yarn of the fabric gives the yarn a somewhat uneven appearance, partly because of the fact that these kemp fibers are whiter than the other fibers of the yarn, and partly because of the fact that many of them are larger and coarser and thus tend to stand out more or less prominently. If an undyed, unbleached yarn of this nature is woven into a cloth having a plain warp thread, the appearance of

FIG. 1



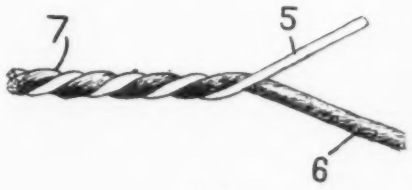


FIG. 2

the cloth will be more or less streaky due to the uneven character of the weft yarn produced by the presence of the kemp. In order to break up this streaky appearance in the cloth and to produce a cloth having an even texture, a variegated warp thread showing different colors is used, such as would be produced by twisting together two strands which are formed of different colors. For making a tan-colored fabric the best results are secured by using a warp thread having a white and a colored strand twisted together, the colored strand being approximately twice the size of the white strand, but the particular colors of the two strands may be varied according to the character of the cloth to be produced. When two strands of this nature are twisted together to the right extent, a warp thread is produced which when used with a mohair weft yarn or thread, such as above described, will produce a fabric having uniform color, the colored and white warp threads operating to break up any streaky appearance which would be produced by the weft yarn.

Fig. 1 is an enlarged view of the weft yarn; Fig. 2 is a similar view of the warp thread.

Personals

James C. Howe, who has been vice-president of the Saco-Lowell Shops for a number of years, in special charge of the sales department, has recently resigned to accept a vice-presidency of the Old Colony Trust Co., of Boston. He has already assumed his new position. Mr. Howe was formerly in the banking business before his connection with the Saco-Lowell Shops, having been vice-president of the American Trust Co. At the time of the reorganization of the Lowell Machine Shops Mr. Howe became connected with that company and continued with the Saco-Lowell Shops.

Herman E. Graichen for the past 42 years an employe of the Arlington Mills, Lawrence, Mass., and for a number of years second-hand in the weaving department, has resigned his position with that company. He was presented with a very handsome solid gold watch, chain and charm as a token of the esteem with which he was held by the employes in the weaving department.

John Backus has been appointed second-hand in the inspecting room of the American Thread Co., Willimantic, Conn., to succeed Robert King.

Robert E. Morrey, superintendent of the Ansonia O. & C. Company, Ansonia, Conn., has resigned his position with that company. He has been over ten years in their employ and had charge of the braiding, thread and cord dressing, also the arm band departments.

John A. Fernley, for many years superintendent of the Butler Mills and the Bristol Mfg. Co., New Bedford, Mass., has been appointed superintendent of the Abedare Weaving Co., Central Falls, R. I.

Andrew K. Hill has been appointed designer for the Joshua Perry Mills, Webster, Mass. He was formerly employed at the Oakland Mfg. Co., Reistertown, Md.

Thomas Hennessy overseer of carding at the Fort Dummer Mills, Brattleboro, Vt., has resigned his position with that company.

William Roberts has been appointed overseer of knitting for the Ipswich Mills, Ipswich, Mass., having been promoted to that position from fixer.

Edward Elsner has succeeded James Hall, Sr., as superintendent of the Burton Company, Clinton, Mass. Mr. Elsner was formerly superintendent of the Brickner Woolen Mills, Sheboygan Falls, Wis.

Matthew Ousley, overseer of the mule spinning department, B. B. & R. Knight, Royal Mills, Riverside, R. I., has resigned his position with that company and is succeeded by Isaac Gourley, who comes from Chicopee, Mass.

David L. Jones has accepted a position as designer for the Sayles & Jenks Mfg. Company, Warren, Mass. He was formerly employed at Fitchburg.

L. B. Gibson has accepted a position as overseer of carding at the Seneca Mills, Seneca, S. C. He was formerly second hand of carding at Union, S. C.

Lon Isenhour has accepted a positon as overseer of spinning at the Thrift Mfg. Co., Paw Creek, N. C. He was formerly employed at the Chadwick-Hoskins Mills. Charlotte, N. C.

J. T. McGregor has resigned his position as superintendent of the Florence Mills, Forest City, N. C., to accept a similar position with the Lowe Mfg. Co., Huntsville, Ala.

J. H. McEntire has accepted a position as overseer of spinning at the Dacotah Mills, Lexington, N. C. He was formerly employed at the Highland Park Mill, Charlotte, N. C.

R. L. Little has accepted a position as superintendent of the Charlotte Cotton Fiber Co., Charlotte, N. C.

John S. Carpenter has been appointed to the position as cotton quarantine inspector for the Federal Inspection Board. He was formerly superintendent of the Melville Mills, Cherryville, N. C.

F. G. Parker has accepted the position as superintendent of the Mt. Holly, Albion and Tuckaseege Mills, Mt. Holly, N. C., and Stanley Mfg. Co., Stanley, N. C.

William Battye has resigned his position as superintendent and designer for the Merrimack Woolen Company, Lowell, Mass.

Mr. M. N. Bresette, overseer of weaving for the Jas. & E. H. Wilson, Pittsfield, Mass., has tendered his resignation, to accept a similar position with Lymansville Company at Providence, R. I.

George Sands has been appointed superintendent for the Corinna Mfg. Company, Corinna, Me. He is overseer of weaving at this mill.

John Chapman, overseer of weaving for the Corinna Mfg Company, Corinna, Me., has resigned his position with that company.

W. L. Carter has accepted a position as foreman of carding and spinning at the Social Circle Mills, Social Circle, Ga. He comes from Draper, N. C.

W. H. Hearne, overseer of spinning at the Thrift Mfg. Company, Paw Creek, N. C., has accepted a similar position at one of the mills at Kannapolis, N. C.

R. G. Adams has accepted a position as overseer of weaving at the Eureka Mills, Chester, S. C. He comes from the Fulton Cotton Mills at Atlanta, Ga.

J. B. Driver has been appointed superintendent for the Millen Mills, Millen, Ga. He comes from the Hope Mills Company, Hope Mills, N. C.

E. S. Trammell has been appointed superintendent for the Cohannet Mills, Fingerville, S. C.

C. A. Shipp has accepted a position as overseer of spinning with the Tifton Mills, Tifton, Ga.

J. W. MacElhannon has accepted a position as overseer of weaving with the Riverside & Dan River Cotton Mills No. 3, Danville, Va.

J. F. Armstrong has been appointed overseer of spinning and twisting at the Whitnel Cotton Mills Company, of Lenoir, N. C.

I. B. Covington has resigned his position as superintendent of the Mt. Holly Mills, Mt. Holly, N. C., to accept a similar position at the Florence Mills, Forest City, N. C.

C. C. Dawson has resigned his position as carder at the Mayes Mfg. Company, Maysworth, N. C., to accept a position as superintendent of the Melville Mfg. Company, Cherryville, N. C.

Ernest B. Nash has accepted a position as overseer of carding for the Fort Dummer Mills, Brattleboro, Vt. Mr. Nash was for several years employed at the Bay State Cotton Corporation, LeRoy, N. Y.

E. B. Mansfield has accepted a position as superintendent for Lander & Watson Hosiery Company, Perry, N. Y. He comes from the Fay Stocking Company, Elyria, O.

Walter Oliver has accepted a position as superintendent and designer for the Merrimack Woolen Company, Lowell, Mass. He was formerly employed at the Darling Woolen Mills Company, Holden, Mass.

John Lynch has accepted the position as overseer of carding for the Holliston Woolen Company, Holliston, Mass. He comes from Worcester, Mass.

Robert A. Ives has been appointed overseer of finishing and sewing machine fixing for the William Sloane Company, Norfolk, Va.

Fred O. Palmer has been appointed overseer of spinning for the Rock River Woolen Mills, Jaynesville, Wis. He comes from Reedsburg, Wis.

J. S. Gammons, overseer of spinning at the Tifton Cotton Mills, Tifton, Ga., has accepted a position with the Exposition Mills at Atlanta, Ga.

John F. Miller has accepted a position as night superintendent with the Puritan Cordage Mills, Louisville, Ken. He was formerly employed by the Silver Lake Company, Newtonville, Mass.

C. Enos Bean has been appointed superintendent for the Pomona Mills, Greensboro, N. C.

W. L. Stevens has been appointed overseer of weaving in the Lois Mill, Douglasville, Ga., succeeding V. T. Adams. Mr. Stevens comes from Salem, Ala.

Arthur S. Thomas, superintendent of the Stark Mills, Manchester, N. H., has severed his connection with the company.

F. J. Ward, superintendent of the Corinna Mfg. Company, Corinna, Me., has resigned his position with that company.

F. H. Vannah has been appointed overseer of carding for the Franklin Mills, Franklin Falls, N. H. He was formerly second-hand in the carding department for Holden, Leonard Company, Bennington, Vt.

Joseph Lankes, superintendent for the Hadley Mills, South Hadley Falls, Mass., has resigned his position with that company. He is succeeded by J. H. Pickford.

Jacob Ashler, overseer of carding at the New England Knitting Company, Winstead, Conn., has resigned his position with that company and has left for a short visit to the Pacific coast.

John Campbell has accepted a position as overseer of finishing for the Bellevue Mills, Clinton, Mass. He was formerly finisher for the National & Providence Mills, American Woolen Company, Providence, R. I.

William C. Gould, master mechanic and chief engineer of the Shaw Stocking Company, Lowell, Mass., has been appointed superintendent to succeed Maurice M. Kalbach.

James R. Hooper, treasurer of the Slatersville Finishing Co., Slatersville, R. I., has resigned his position. He is succeeded by H. P. Kimball, who was treasurer of the Holliston Mill, Norwood, Mass.

W. R. Bliven has accepted a position as overseer of carding at the National Woolen Co., Cleveland, Ohio. He was formerly employed at the Patrick Duluth Woolen Mill, Duluth, Minn.

John S. Fassett has accepted a position as overseer of dyeing at the North Star Woolen Mill, Minneapolis, Minn. He was formerly employed at the Holden, Leonard Co., Bennington, Vt.

J. F. Bresett has accepted a position as overseer of dyeing at the Rock River Woolen Mill, Janesville, Wis. He comes from Pascoag, R. I.

Thomas P. Jones has accepted a position as sewing machine fixer at the Taunton Knitting Co., Taunton, Mass.

James E. Donahue has accepted a position as overseer of carding at J. Broadbent & Son's Mill, Unionville, Conn. He was formerly employed at the Felters Co., Millbury, Mass.

Alfred L. Stebbins has accepted a position as master mechanic at the Bernon Mill, Georgiaville, R. I. He was formerly employed at the Ashland Cotton Co., Jewett City, Conn.

McClellan J. Scagel has accepted a position as overseer of finishing at the Mercury Mill, Ltd., Hamilton, Ont., Canada. He comes from Oriskany Falls, N. Y.

C. E. Donovan has accepted a position as overseer of weaving at the Valley Woolen Mill, Cherry Valley, Mass.

Robert Coleman has been appointed manager and superintendent of the Valley Creek Cotton Mills, Selma, Ala.

James Laughlin has accepted a position as second hand in the carding department at the Hecla Mill, American Woolen Co., Uxbridge, Mass., to succeed Thomas Riley, who was promoted to the position of overseer to succeed George Bassett.

Harry G. Walker has been appointed manager of the New York office of Walter H. Langshaw & Company, selling agents for the Dartmouth Mill. Mr. Walker was formerly a member of the New Haven office of M. Heineman & Company, New York brokers.

G. W. Taylor has been elected president of the Valley Creek Mills, Selma, Ala.

C. Strickland has been elected president of the Strickland Cotton Mills, Remerton, Ga.

W. H. McGuinn has accepted a position as overseer of carding at the Greenville Cotton Mills, Greenville, N. C.

J. W. Moore has accepted a position as overseer of spinning at the Richland Plant, Hampton Mills, Columbia, S. C.

Milton Saylor has been elected secretary and treasurer of the Valley Creek Mill, Selma, Ala.

B. P. Green has accepted a position as overseer of spinning at the Prendergast Cotton Mills, Prendergast, Tenn.

Alexander McCaskill has accepted a position as overseer of spinning at the Naomi Cotton Mill No. 2, Randleman, N. C.

W. T. Chafin has been appointed night superintendent of the Richmond Hosiery Mill, Rossville, Ga.

George H. Anderson has been appointed superintendent of the Maplecroft Mills, Liberty, S. C. He formerly held this position.

J. W. Brown has accepted a position as overseer of carding and spinning at the Hampton Mills, Capital City Plant, Columbia, S. C.

William H. Slater has accepted a position as overseer of spinning at the Himes Underwear Company, Cohoes, N. Y.

W. Ingraham has accepted a position as designer for Hall Bros., woolen manufacturers, Norwich, Conn. He comes from Utica, N. Y.

George Dixon has accepted a position as overseer of carding at the Himes Underwear Company, Cohoes, N. Y.

Dana D. Brayton has been elected by the Board of Directors of the Durfee Mill, Fall River, Mass., to the position of president, to fill the vacancy caused by the death of his brother, John J. Brayton.

At a meeting of the stockholders of the Blue Ridge Knitting Company, Hagerstown, Md., the following officers were elected: President, Jacob Roessner; vice-president, Irvin R. Linton; treasurer, H. E. Stamm; secretary, Charles H. Roessner.

H. C. Davis, overseer of weaving at the Nockege Mill, Fitchburg, Mass., has resigned his position with that company. He is succeeded by James Leach, formerly second hand of weaving at the Hathaway Mill, New Bedford, Mass.

John T. Jarvis has accepted a position as overseer of the cloth department at the Arkwright Mill, Fall River, Mass. He was formerly employed at the Barnaby Mill, same city.

William McKnight, overseer of weaving at the Abedare Weaving Company, Central Falls, R. I., for the past six years, has resigned his position with that company. He is succeeded by John A. Finley, who comes from New Bedford, Mass.

William Wilkie, overseer of burling and sewing at the Uswoco Mill, U. S. Worsted Company, Lawrence, Mass., has resigned his position with that company. He was presented with a gold watch and chain as a token of the esteem in which he was held. Mrs. Wilkie was presented with a cut glass vase.

Paul H. Redcay has accepted the position as overseer of finishing for the Lebanon Textile Company, Lebanon, Pa. He comes from Reading, Pa.

William Topp, in charge of the repairing department at the Whitinsville Cotton Mills, Whitinsville, Mass., has resigned his position with that company.

E. E. Partain has accepted the position as superintendent of the Dallas Hosiery Mills, Dallas, Ga. He comes from Frostburg, Md.

W. E. Fearrington has been appointed superintendent of the Holt Williamson Manufacturing Company, Fayetteville, N. C.

J. A. Jenkins, superintendent of the W. S. Gray Cotton Mills, Woodruff, S. C., has also been appointed superintendent of the Vardry Cotton Mills, Greenville, S. C.

E. A. Holt has accepted a position as overseer of carding at the Wylie Mills, Chester, S. C. He was formerly employed at the Springstein Mills of the same place.

G. H. Barnhardt has accepted a position as overseer of weaving at the Alta Vista Cotton Mills, Alta Vista, Va. He was formerly employed in a similar position at the Brown Manufacturing Company, Concord, N. C.

E. L. Adams has been promoted to overseer of carding at the Springstein Mills, Chester, S. C.

F. D. Whitaker has accepted a position as overseer of carding and spinning at the Vardry Cotton Mills, Greenville, S. C.

J. F. James has accepted a position as overseer of spooling, warping, winding, twisting and reeling at Mill No. 2, Stonewall, Miss.

Lester D. Patt, formerly designer at the Acushnet Mill, New Bedford, Mass., has resigned to accept a similar position with the Waypoyset Manufacturing Company, Central Falls, R. I.

Abraham Lehrs has been appointed vice-president of the Columbia Knitting Mills, Inc., New York City. He was formerly employed at Gloversville, N. Y.

DEATHS.

Charles Ried, employed as a foreman in the Amoskeag Mfg. Co., Manchester, N. H., died at his home in that city at the age of 54 years, having been a resident of Manchester for 33 years. He leaves a wife, one son and daughter. He was a member of the Wildey Lodge of Odd Fellows.

Benjamin S. Kendall, for 40 years master mechanic of the Manchester Print Works, operated by the Amoskeag Company, Manchester, N. H., died in that city at the age of 86 years. He had resigned his position with the company some time ago and was living in retirement. He is survived by two sons. He was a member of the Lafayette Lodge, A. F. & A. M., Mt. Horeb Chapter, R. A. M.

H. H. Wildt, of the firm of Wildt & Company of Leicester, England, manufacturers of knitting machinery, died at the Astor Hotel, New York City, where he had been stopping for a few months. His death occurred July 19th and physicians say that heart disease was the cause.

Dr. Armand Mueller, one of the leading chemists in this country, died at his home in Huntington, Long Island, following a shock of paralysis. He was 60 years of age and born in Switzerland. It was reported that he was the creator of the turkey red dyeing process, and he was also a writer of great ability.

John J. Brayton, president of the Durfee Mill, Fall River, Mass., died suddenly June 27. He had been at the head of the Durfee Corporation for many years and was a heavy real estate owner in Fall River. He is survived by his sister and one brother.

Thomas E. Hippin, of Hippin-Hollweg & Company, a large wholesale dry goods establishment in Indianapolis, Indiana, died suddenly in New York on July 6th of heart failure following an attack of acute indigestion. Mr. Hippin was buyer for the firm of which he was a member and spent a large part of his time in New York City. Outside of his business connections he was well known in art circles, being a liberal patron of art and himself an artist of no mean talent. In his early days he was engaged in newspaper work and was a pen and pencil artist on the Indianapolis News, being one of the first in that profession.

Peter King, a retired woolen manufacturer, died at his home in Northampton, Mass. He was born in Armley, Eng., in 1836. For a number of years he was superintendent of the Bridgewater Woolen Mill at Bridgewater, Vt. He retired from active mill life several years ago.

Sigmund H. Weihenmayer, treasurer of the Blue Ridge Knitting Company, Hagerstown, Md., committed suicide by shooting himself at his home in that city. Several weeks ago his son was accidentally shot by a companion and Mr. Weihenmayer has been very despondent since. His widow and one daughter survive him.

James H. O'Connell, overseer of the spooling and winding departments at the Upper Pacific Mill, Lawrence, Mass., died at his home in that city on June 30 after an illness of several weeks. He was 38 years of age and is survived by his wife and parents.

W. A. Whitney, proprietor of the Superior Knitting Mill, Superior, Wis., was killed in an automobile accident in Virginia, Minn. Mr. Whitney was actively interested in other industries in Superior.

Walter H. McDaniel, manager of the U. S. Bunting Company, Lowell, Mass., died suddenly while on a pleasure trip through the far West. Word was received by telegram from Seattle, Wash., to Paul Butler announcing his sudden death. He was considered one of the best experts in this country on wool and worsted goods. Mr. McDaniel was 67 years of age and is survived by his wife, a brother and one sister.

Louis Whitney, for the past fifteen years overseer of weaving at the Nashua Manufacturing Company, Nashua, N. H., died suddenly at his home in that city July 25 from heart failure. He is survived by his wife and an adopted daughter.

Facts and Gossip.

Canada, British Columbia, Vancouver. The Universal Knitting Company, which recently removed to 624 Smythe St., now has 18 knitting machines and 8 sewing machines operated by electric power. This concern manufactures men's, women's and children's coats and sweaters, and gives employment to 20 hands. A. C. Cohen, formerly manager of the Pride of the West Knitting Co., Ltd., of Vancouver, is president. The capital stock is $25,000.

Canada, Ontario, Toronto. Allen Bros. Co., Ltd., has been incorporated with capital stock of $40,000 to manufacture silk, linen, cotton and woolen goods. The incorporators are Archibald M. Heustis, Henry Howitt, Bruce Fitzgerald Fisher, George Montheith and Wilson N. Robinson. This company will take over the business formerly conducted by J. M. & K. W. Allen, under the name of Allen Bros. Co., hosiery, who will be paid in stock of the new company.

*Georgia, Gainesville. Fifty knitting machines and 2 sewing machines are now operated at the plant of the new Merck-Hetrick Mfg. Company, on hosiery. It was noted previously that this company would increase its knitting equipment. The present capital stock of the company is $10,000, but this will be increased immediately. They have a piece dye house and steam and electric power. Forty-five hands are employed in this mill. B. H. Merck is president and treasurer, and W. F. Hetrick is superintendent and buyer. Hinchman, Vezin & Co. sell the product.

New Publications

Any work noticed under this heading can be obtained, postage or express charges free, by sending the price listed to Lord & Nagle Company, 144 Congress St., Boston, Mass. A catalogue of textile books in the English language will be sent free on application.

The American Directory of the Knitting Trade of the United States and Canada, (The "Red Book"), 1915 edition; compiled by the Textile World Record; 695 pages; 4 textile maps; Lord & Nagle Company, Boston, New York and Philadelphia, publishers. Price, postpaid, $1.50.

The new 1915 edition of the American Directory of the Knitting Trade of the United States and Canada has been issued and can be supplied immediately on receipt of order. This is the 33rd annual edition. Few editions of the Knitting Directory have carried to the trade information of so many changes and opportunities for new business. There have been added 150 new mills and over 100 old concerns have dropped out. Hundreds of concerns in allied lines have been added and total changes in old lists probably runs into five figures. During the past year the American knitting trade has become an important factor in the export world and to help promote the growth of foreign business we have added to the Directory this year new lists of Export Firms in New York City, London Agents and Importers, and British Jobbers and Wholesalers. A brief synopsis of the contents of the American Directory of the Knitting Trade is given below: Full report of every knitting mill in the United States and Canada, arranged alphabetically by States and towns, giving capitalization; names of the officers, including superintendent and buyer; kinds of goods made; number of knitting machines, number of sewing machines; whether the mill dyes or bleaches or finishes; kind of power; number employed; selling agent; kind and sizes of yarn bought. Special copyrighted maps of the mill districts showing the cities and towns where there are knitting mills. It is indexed so that any town may be quickly found. Carefully classified index of manufacturers according to kind of goods made. All the manufacturers of the same kind of goods are grouped together. Manufacturers' Selling Agents and Commission Merchants handling knit goods. Export Firms in New York City handling hosiery, underwear and knit goods, showing the kind and class of goods handled and the countries to which they ship. British Jobbers and Wholesalers of Hosiery, Underwear and Knit goods, including the names of concerns in important cities of the United Kingdom. List of Jobbers of Knit Goods in the U. S. telling the kind of goods handled and the name of the buyer; very complete. Department Stores and Large Retailers in the U. S. handling knit goods. Other features are an Alphabetical Index of Manufacturers. List of Knitting Yarn manufacturers. Lists of Dyers, Bleachers, Finishers and Printers making a specialty of work for Knitting Mills; London Agents and Importers; New York Buyers of Knit Goods; New York Addresses of Out of Town Jobbers; and an Index of Machinery and Supplies. The demand of the distributing end of the industry for a separate book giving only the particular lists required in its work is supplied by the Knit Goods Trade, price $1. This is a handy 300-page book giving classified lists of Manufacturers. Jobbers, Department Stores, Large Retailers New York Buyers, New York Addresses of Out of Town Jobbers, Manufacturers' Selling Agents, Export Firms in New York City, London (England), Agents and Importers, British Jobbers and Wholesalers.

Davison's Textile Blue Book; The Davison Publishing Co., New York. Price $4.00 and $3.00.

The 28th annual edition of this well known publication has just been issued in its usual comprehensive form, covering not only the textile mill reports, but lists of auxiliary lines under various classifications, together with textile maps. It is issued in three editions, the office edition, the pocket edition and the salesmen's editions. It is well printed and bound and is compiled in its usual careful way.

Clark's Directory of Southern Cotton Mills; The Clark Publishing Co., Charlotte, N. C. Price $1.00.

The eighth edition of this publication has been received and shows evidence of the usual careful preparation. Accurate data is given relative to the cotton mills of the South. The book does not include knitting mills, except those that spin cotton.

Industrial Notes

SAVING LUBRICATING WASTE IN TEXTILE MILLS

The New York & New Jersey Lubricant Company, 165 Broadway, New York, has organized a department for the study and advice on textile machinery lubrication. The men of this department are former millmen having a knowledge of textile mill machinery. Their specific duty is to conduct tests in the various departments of the mills and show exactly what lubricant is best adapted to each machine and which will most effectively overcome friction and keep down maintenance cost as well as insure freedom from damage to goods in process of work; as well as show exactly the saving that they claim can be effected through the use of Non-Fluid Oil.

Suggestions and advice from the department are furnished without obligation to any millowner, superintendent or engineer interested in the subject of better lubrication and economy of operation. A most comprehensive textbook on this subject has been prepared and both textbook and advice will be sent without obligation.

A NEW INCORPORATION OF ESTABLISHED FIRM

The Carrier Engineering Corporation was incorporated last week at Albany with Willis H. Carrier at president and chief engineer; J. I. Lyle, treasurer and general manager and E. T. Murphy, secretary, and with the principal office at 39 Cortlandt St., New York.

This new company will take over all of the special air conditioning work of the Carrier Air Conditioning Co., including all applications of the latter company's machines to the various industries requiring humidifying, dehumidifying or humidity regulation.

The sale of Carrier air washers has been given to the sales organization of the Buffalo Forge Co. to be handled in future with their fan and heating apparatus.

Air conditioning may be divided into two general lines, one being air washing and humidifying in connection with ventilation of public or semi-public buildings, such as schools, hotels, court houses, theatres, etc., the application being simply an adjunct of the ventilating equipment for which standard designed machines have been developed. The selection of the proper machine is comparativly easy and for which work the sales force of the Buffalo Forge Co. is excellently fitted.

On the other hand, but few more complex problems are dealt with by engineers than the regulation of humidity and temperatures in various industrial processes, such as textile mills, chemical plants, celluloid, photographic papers and moving picture factories, etc.

The high position held by the Carrier Air Conditioning Co. is undoubtedly due to the excellence of the engineering staff which they had organized and all of which will be taken over by the Carrier Engineering Company.

W. H. Carrier has undoubtedly done more in the development of air conditioning than any other man. His contributions to the scientific knowledge of the subject have brought to him international recognition, while his success in the solving of new problems in fan engineering and air conditions, with his inventions of humidity regulating apparatus, have given him a place among the foremost engineers of the country. He has been prominent in the councils of the American Society of Mechanical Engineers and the Heating & Ventilating Engineers. His hand book, "Fan Engineering," is no doubt the most comprehensive work of its kind.

Those in a position to know give to J. I. Lyle the credit for a large measure of the commercial success of the Carrier Air Conditioning Co., for he standardized the Carrier designs for the various applications and to him was also due their very broad and liberal policy, both in dealing with their customers and in the spreading of reliable information regarding the subject of air conditioning.

Mr. Lyle's opinions on engineering subjects are given much respect and consideration by those who know him. He has presented several papers before the American Society of Heating & Ventilating Engineers and the American Society of Refrigerating Engineers, in both of which he is a member and by invitation before the International Congress of Refrigeration.

Mr. Lyle will have charge of the commercial end of the new company.

E. T. Murphy, the secretary, is a quiet, unassuming and efficient engineer, who never seeks the limelight, but who possesses a wealth of knowledge on air conditioning and kindred subjects and best of all knows how to apply it. He will supervise the Philadelphia office, in which city he has a host of friends.

The Chicago office will be in charge of A. E. Stacey, Jr., a young engineer who assisted Mr. Carrier in his earlier experiments. Mr. Stacey is thoroughly familiar with every phase of air conditioning and will be very ably supported by the assistant manager, E. P. Heckel.

E. T. Lyle, who has made a specialty of textile mill humidification, will be retained in charge of the Boston office. L. L. Lewis, as heretofore, will be the engineer in charge of design and estimating.

BRITISH HOSIERY AND UNDERWEAR JOBBERS

In addition to the list of British hosiery and underwear jobbers published in the American Directory of the Knitting Trade for 1915, we are advised that the following concerns are large merchants and probably interested in American knit goods: Solomon Stern, Ltd., 13 Nicholls Sq., London, E. C.; F. W. Millington & Co., Manchester, England.

THE GERMAN TEXTILE TRADE

By Consul Edward Higgins

Cotton goods.—Business was satisfactory. The price of raw cotton was high in August, 26 cents a pound. The supply was small, but considerable amounts were received during the year from the United States. The manufacturers have been very busy filling Government orders. No cotton goods are exported. Prices advanced 15 to 25 per cent.

Underwear, woolen and mixed.—The leading manufacturers of underwear were very busy last year. During the first six months business steadily improved in the domestic and foreign markets. There was a good demand for medium and fine grades. Exports to England increased about 25 per cent. Exports to the Scandinavian countries were exceptionally good. Business with Italy, Roumania, Bulgaria and Greece also increased, while business with France and the United States decreased. Business with South America was satisfactory, the increase amounting to about 20 per cent. Most of the small manufacturers have gone out of business during the past few years. Only large, old-established houses with sufficient capital can do a satisfactory and profitable business. After the outbreak of the war, manufacturers were kept busy filling Government orders and supplying the domestic market. Exports practically ceased. Cotton was high, but the supply was fairly large. There was a scarcity of skilled operators.

STANDARD ANILINE PRODUCTS, INC., NOW READY FOR BUSINESS

The Standard Aniline Products, Inc., with offices at 366 Fifth Avenue, New York, inform us that they are now in a position to fill all contracts for their product at contract prices and also trial lots at a spot price for first consignment. The company is contemplating the manufacture of other products and will gladly answer all inquiries regarding same.

THE A. AND M. TEXTILE SCHOOL

At the graduating exercises of the A. & M. College, Raleigh, North Carolina, the student medal which is awarded annually by the National Association of Cotton Manufacturers was presented to W. I. Smith, Asheville, N. C., who graduated from the Textile Department of the above college. This medal is awarded annually to the textile student graduating with the highest honors

J. S. P. Carpenter, another graduate of this Textile Department and who is now superintendent of the Melville Manufacturing Company, Cherryville, N. C., has been appointed quarantine inspector for the Federal Horticultural Board. Mr. Carpenter will be succeeded as superintendent by C. C. Dawson, overseer of carding, Maysworth Manufacturing Company, Maysworth, N. C., also a graduate of the A. & M. textile department.

COTTON PRODUCTION IN THE UNITED STATES

From the Commerce Reports

The forthcoming report on cotton production in the United States, soon to be issued by Director Sam. L. Rogers of the Bureau of the Census, Department of Commerce, and prepared under the supervision of William M. Steuart, chief statistician in charge of the inquiry, will show the American cotton crop of 1914—16,134,930 equivalent 500-pound bales—to have been the largest ever produced, exceeding the 1913 crop by nearly 2,000,000 bales, or about 14 per cent. The largest crop raised prior to 1914 was that of 1911—15,692,701 bales. The tables contained in this report will be reprinted in the annual cotton bulletin to be published in September, which will also include further data as to production, consumption, imports, exports, and stocks of cotton.

The increase in the production of linters during the past 15 years is noteworthy. Starting at 114,544 bales in 1899, the output of this product increased to 791,464 bales in 1914, or by nearly 600 per cent., although the amount of cotton ginned increased by less than 75 per cent. during the same period. This increase in the linter production is due principally to closer delinting of the seed for the better separation of the meat from the hulls. Many mills now obtain considerably more than 100 pounds of linters per ton of seed treated, whereas in earlier years 50 pounds per ton was a high yield.

Sea-island cotton, of which 81,654 running bales were ginned in 1914, represented in that year only a trifle more than one-half of 1 per cent. of the total cotton produced. The largest crop of sea-island cotton raised in any year between 1899 and 1914 was that of 1911—119,293 bales. This variety of cotton is produced in only three States—Georgia, Florida, and South Carolina.

Although cotton is grown in 18 States, only 6—Texas, Georgia, Alabama, South Carolina, Oklahoma, and Mississippi—produced more than a million bales each in 1914. The combined growth of these 6 States represented over four-fifths of the total crop of that year.

Texas alone produced 4,592,112 bales, or more than one-fourth of the total grown in 1914. The next greatest production was that of Georgia, 2,718,037 bales, or one-sixth of the total. Other States producing large crops were Alabama, with 1,751,375 bales, or 10.8 per cent. of the total; South Carolina, with 1,533,810 bales, or 9.5 per cent. of the total: Oklahoma, with 1,262,176 bales, or 7.8 per cent. of the total; and Mississippi, with 1,245,535 bales, or 7.7 per cent. of the total.

The cotton production of California, which has recently taken up the growth of this staple, is increasing rapidly. In this State 49,835 bales were ginned in 1914, as compared with 22,838 in 1913 and 8,215 in 1912. Not all this cotton was grown in California, however, since the figures given include cotton raised in the Mexican portion of the Imperial Valley and brought into California to be ginned.

Although the cotton production of Arizona still amounts to an insignificant fraction of the total for the country, it is increasing rapidly, 7,142 bales being reported for this State in 1914, as compared with 2,299 for 1913.

The banner cotton county in respect to number of bales produced is Ellis County, Tex., in which the ginnings from the growth of 1914 amounted to 143,714 bales—aproximately 75 per cent. more than the entire crop of Missouri or Florida, about three times that of California, and nearly six times that of Virginia. The area of Ellis County is 975 square miles and its population is about 55,000.

A NOVEL FASHION SHOW

A novel idea for the extension of fashion news is being promoted by the Whitney Fashion Corporation, in New York. A fashion show is to be presented at one of the leading theatres in New York in the autumn where an elaborate production will be given of model dresses shown on living models. These will illustrate the latest French, English and American styles and fabrics. It is then proposed to make moving picture films of this stage production which will be distributed all over the United States. The management claims that special attention will be given to American fabrics and what can be done with them in producing the most fashionable costumes. The service experts also to offer suggestions to manufacturers in advance of the season and through a series of weekly bulletins of fashion news to be of service to the retail merchant.

NEW BEDFORD TEXTILE SCHOOL

The enrollment of students at the New Bedford Textile School for the class which will enter next fall is larger than ever before at this time of the year. This year the school gave an entrance examination in June for the first time. Indications are that the entering class next September will be the largest in the school's history.

The Department of Agriculture is still conducting cotton tests at the New Bedford Textile School though the school is closed for the summer. During the past week two lots of Egyptian cotton have arrived at the school, one of them fumigated and the other unfumigated. The tests will show the effect of fumigation on the cotton as to its strength in the yarn, bleaching quality, and mercerization quality.

The staff of government employes working on these tests has been increased to eight. T. C. Adams, an assistant cotton technologist for the Department of Agriculture, has recently joined the force, and in addition several young men from mills in this city have been engaged to assist in the work.

A very interesting object included in the exhibit of students' work for the past year was a miniature steam engine of one-quarter horse power made by a South American student who could not speak English when he came to the school. The engine has all the essential parts and runs well under proper steam pressure. The high character of the workmanship on it testifies not only to the excellent mechanical department of the school but to the student's natural abilities in this direction.

DEVELOPMENT OF RUSSIAN FLAX INDUSTRY

Consul General John H. Snodgrass, Moscow

A considerable development of production is being observed in the Russian flax industry. In some concerns the number of spindles has increased by 4.3 per cent., and all flax mills are working at full speed, a number of new concerns are also being established. After the reconstructions and extensions that are taking place, the number of spindles in the Russian industry will be increased by 20,000 or 22,000, which amounts to about 5 per cent. of the whole number, and this will cause an increase in the consumption of flax of 4,500 to 5,400 short tons.

In connection with the increased production, there is observed a certain lowering of the average standard of flax thread. Previous to the war the finest flax yarn was produced by Ireland, followed by Belgium and France, Germany, and Russia, the average standard of the Russian yarn not exceeding No. 15. In 1900 77 per cent. of the total quantity of linen fabrics manufactured consisted of coarse fabrics, such as sailcloth, crash, canvas, bags and packing material, and only 23 per cent. of finer and medium linen cloth and damask. In 1908 the corresponding proportion was expressed by the figures 70.1 and 29.9 per cent., showing a certain increase in the manufacture of finer cloth. However, from the beginning of the war there was a great increase in the demand for coarser and heavier cloths, and the Russian linen industry had to adapt itself to the production of coarser yarn, which in turn causes a greater consumption of flax.

KISSEL MOTOR TRUCKS

That KisselKar Trucks will hereafter appear in seven sizes—adding one model to the line—is the official announcement from the Kissel factory. The capacities will be 1000 lbs., 3/4 to 1 ton, 1 to 1 1/2 ton, 1 1/2 to 2 ton, 2 1/2 to 3 ton, 3 1/2 to 4 ton and 6 ton.

The 1000 pound delivery is the new member of the group and marks the entry of Kissel into the light commercial vehicle field. It is, therefore, attracting a lot of attention in the trade. The stripped chassis weighs 2200 pounds and the length over all is a little more than 14 feet. It carries a new Kissel-built block motor of 32 horse power. The wheel base is 115 inches.

Aside from this new model probably the most interesting feature of the Kissel announcement is the adoption of a worm drive rear axle on the medium size models. The worm is of David Brown construction.

All the trucks have Kissel-built motors. The two smaller sizes have 32 horse power, the next two a 36 horse plant, cast enbloc. The 2 1/2 to 3 ton has 40 horse power, the two larger sizes a 50 horse power engine.

The Kissels are presenting as features of the truck line several standard body designs, including a street sprinkler and flusher, dumping wagons, fire apparatus, ambulances, police patrols and jitney busses.

WOOLEN-CLOTH ORDERS IN JAPAN

Consul General Scidmore, of Yokohama, reports Russian orders for woolen cloth so far received by Japanese wool-weaving companies have amounted in value to about $4,980,000. The unfilled part of these orders is to be executed by the end of August. There has now arrived a third batch of similar orders from Russia, and the Japan Wool-Weaving and other companies are now considering the terms on which to book them. The increased demand for wool has created great pressure in the wool market. Japanese wool weavers therefore demand an increase in price of 15 to 20 per cent. on the new orders, and, according to the Asahi (Osaka), are conducting negotiations to that end.

AMERICAN SILK RIBBONS FOR COSTA RICA

Consul C. Donaldson, Fort Limon, June 22

The value of the total annual importation of silk ribbons at Port Limon averages about $40,000, of which in the past Germany has supplied approximately 60 per cent., France 20 per cent., Italy 8 per cent., England 5 per cent. and the United States about 4 per cent. At present, owing to the disturbed conditions in Europe, practically all of this trade should go to the United States.

RICE'S MILL WHITE AT THE EXPOSITION

The illustration shows the attractive exhibit of the United States Gutta Percha Paint Co., manufacturers of Rice's Mill White, at the San Francisco-Panama Exposition. The company recently received word that it had been awarded a gold

THE EXHIBIT OF RICE'S MILL WHITE AT THE SAN FRANCISCO-PANAMA EXHIBITION

medal for its products. In over 3,000 big manufacturing plants Rice's Mill White now covers the ceilings and walls. In spite of the recent enlargement of the plant they are still obliged to run sixteen hours per day to fill the increasing demand for their product.

KNITTING MACHINE CONCERN REORGANIZES

The General Machine Works, builders of rib knitting machinery, at York, Pa., has been reorganized and is now under new management and ownership. Their line of machinery will be still further developed and improved, and prompt attention to orders and inquiries is promised.

A HANDKERCHIEF FREE

The Seydel Mfg. Co., 88 Forrest St., Jersey City, N. J., give an interesting practical demonstration of the advantages of Sizol. They offer to send free to any manufacturer or weaver a handkerchief in which the warps were sized with Sizol so that they may see how well the goods are woven.

REMOVAL NOTICE

R. D. Whitmore Co., dealers in imported and domestic cotton and worsted yarns, moved on the first of August to 121-123 East 24th St., just off Fourth Ave., New York.

CORRECTION

Nathan Neuman is the proprietor and superintendent of the Paragon Knitting Mills, 2,200 Arch St., Philadelphia, and has no connection at the present time with the Puritan Knitting Mills, 313 Arch St., although he was formerly connected with it. Harry Neuman is connected with the Puritan Knitting Mills of Pennsylvania, of which Titelman & Neuman are proprietors, H. Neuman being the buyer.

DUTCH FLAX CROP CONDITIONS

The Netherlands produce annually about 20,000,000 pounds of flax fiber and 500,000 bushels of seed, the output of the former being about half that of Belgium, while Belgium produces about an equal quantity of seed. The hampered shipments of flax from belligerent countries create an inquiry as to flax conditions in the Netherlands, concerning which Vice Consul G. H. Krogh, of Rotterdam, sends the following crop report, dated June 24:

"The condition of flax varies largely. In the Provinces of North Holland and Zeeland it is favorable, particularly so in the latter Province (with the exception of Zeeland-Flanders), where is promises to be very good. In the Province of South Holland the flax seems to remain rather short, notwithstanding which fact the condition in this Province is quite satisfactory. In the Province of Groningen the growth of flax is very irregular; in fact, some parcels are really very bad, but still the general growth may be considered favorable. In the Province of Friesland the condition is also irregular; on the clay there is an average growth, while on the sandy soil it is reported to be very good."

SHIPMENT OF COTTON TO NETHERLANDS

The Netherlands Oversea Trust will in general issue licenses to import cotton upon receipt of application accompanied by a bank guaranty that the cotton will be spun in Holland, and the licensee may then notify the Holland-America Line to accept the consignment. The Oversea Trust, however, reserves the right to refuse licenses to applicants who are considered to be accumulating too much stock or who for other reasons may lack the confidence of that organization.—Cablegram from American Ambassador, The Hague, received July 7, 1915.

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FIFTIETH ANNIVERSARY SOUVENIR

As a souvenir of its fiftieth anniversary, the Worumbo Co., 334 Fourth Ave., New York, with mills at Lisbon Falls, Me., has sent to its customers an apparatus for testing a woolen fabric to ascertain if it contains cotton. The outfit is very complete and full directions are given for testing the material, according to the well known methods.

The Worumbo Mfg. Co. at its start determined to manufacture woolen fabrics of as fine a quality as were made anywhere in the world. This aim has been unfalteringly adhered to and the Worumbo goods are known throughout the trade as all wool fabrics of the finest quality. The greatest contributing factor for this result is probably the fact that the late Galen C. Moses, the first treasurer of the mill, who laid down the original policies, occupied the position for 50 years, and its present manufacturing agent, Frank Gutmann, has held his position for substantially the same period. These two men have kept its reputation beyond question.

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RUSHED ON PAINT ORDERS

The U. S. Gutta Percha Paint Company, Providence, R. I., manufacturers of Rice's Gloss Mill White, report that notwithstanding the recent additions to their manufacturing plant they are compelled to work 16 hours a day in order to keep up with orders for their Mill White Paints.

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LAWRENCE TAX VALUATIONS

Following are the valuations placed by the assessors on some of the big Lawrence mills:

The Ayer Mill, with a total valuation of $2,226,450.
The Everett Mill, with a valuation of $1,583,750.
The Farwell Bleachery, with a valuation of $251,000.
The Lawrence Duck Co., rated at $380,850.
The Monomac Spinning Co., rated at $350,500.
The Pacific Mills, rated at a total of $9,250,800.
The Pemberton Co., rated at $418,200.
The United States Worsted Co., at $751,750.
The American Woolen Co. for the Washington Mills, with a valuation of $3,351,200.
The Prospect Mill, at $110,000.
The Wood Worsted Mill is rated at $5,635,250.

FOREIGN TRADE OPPORTUNITIES

The Bureau of Foreign and Domestic Commerce, Washington, D. C., has published the following items regarding opportunities for foreign business in textile materials. The addresses may be obtained from the Bureau and its branch offices. Request for each opportunity should be on a separate sheet and the file number given.

Cloth No. 17073: A manufacturer of shirts, collars and cuffs in Chile is interested in securing samples of fancy materials for the manufacture of shirts. It is stated that if the prices and quality are suitable, a large order will be placed. Interlinings are also desired.

Cloth No. 17431: A business man in Brazil desires to obtain an agency for the sale of cloth, such as "Palm Beach" and similar materials.

Cassimeres, velveteens, unbleached linens, etc., No. 17075: A Chilean firm wishes to place orders for cassimeres, velveteens and unbleached linens, women's novelties, canvas for trunks, laces, hosiery, handkerchiefs, and general lines for dry goods stores.

Cotton yarns and twist, No. 17294: A man in Switzerland who has been connected with a school for the technical weaving industry desires to be placed in communication with American spinners with a view to securing an agency for American cotton yarns and twists.

Hosiery, etc., No. 17190: An American consular officer in France is informed by a commission agent that he is anxious to make connections with American manufacturers of hosiery and knit goods for women.

Cotton textiles, etc., No. 1747: A wholesale and retail dry goods firm in Chile desires to secure samples and prices from American manufacturers of all kinds of cotton goods, linens, oxfords, percales, etc., for dresses; ticking for mattresses, etc.

Cotton yarns, No. 17078: The commercial attache of the Department of Commerce in Australia reports that a manufacturer in his district desires to import American cotton yarns.

Underwear, millinery, etc., No. 17087: A company in Greece desires to import underwear, fancy trimmings, millinery, ribbons and laces, hosiery, shirts, cravats, hardware, paper, toys, linoleum, traveling accessories, etc. It is stated that the firm is in immediate need of cabot, cotton, and woolen underwear in considerable qantities.

Cotton, No. 17104: An American consular officer in Switzerland reports the name and address of an agent in his district who desires to represent American exporters of raw cotton.

Cotton and woolen goods, No. 17105: A firm in Greece informs an American consular officer that it is in the market for American cotton and woolen goods.

Cotton goods, No. 17120: An American consular officer in Greece states that a firm in his district is now in the market for gray sheetings and drills, in pieces and in remnants. The firm also imports cotton flannels, shirtings, cotton suitings, etc.

Hosiery, furniture, etc., No. 17202: A commission merchant in the British West Indies desires agencies for hosiery, ranging from 60 cents to $3 per dozen.

Cotton goods, No. 17113: The commercial attache of the Department of Commerce in Australia reports the name of a man who desires to represent American manufacturers and exporters of cotton goods.

Piece goods, No. 17213: Three merchants in East Africa have requested an American consular officer to supply samples and full information relative to piece goods.

Cotton goods and lard, No. 17240: A commission agent in one of the insular possessions desires to establish commercial relations with American exporters of muslins, nankeen, drills, and other cotton goods.

Hosiery and underwear, No. 17265: A business man in Ireland desires to represent American manufacturers of underwear and hosiery for women.

Hosiery, etc., No. 17179: An American consular officer in France reports that a firm in his district desires to represent American manufacturers of hosiery and knit goods for women.

Hosiery, underwear, etc., No. 17272: A firm in New York City writes the Bureau of Foreign and Domestic Commerce that its agent in India states that there is a great demand in that market for American hosiery, underwear, shirts, collars, ties, suspenders, etc.

Needles, No. 17211: A firm in England desires to communicate with American manufacturers of hosiery, latch and bearded, needles.

Underwear and hosiery, No. 17260: An American consular officer in England has transmitted a report relative to a possible opportunity for the sale of underwear and hosiery.

Yarns, No. 17151: An American consular officer in France reports that a commission agent in his district desires to represent American manufacturers of cotton yarns for weaving.

Underwear and hosiery, No. 17474: A manufacturer's agent in Ireland desires to communicate with American manufacturers of fleeced underwear, and lisle and silk hosiery for women, with a view to selling these goods on a commission basis.

Twine and cotton yarn, No. 17475: A firm in Argentina wishes to receive samples of twine for sewing jute and cotton bags, also cotton yarn.

Knitted underwear, hosiery, etc., No. 17521: An American consular officer in Scotland transmits a letter from a business man in his district who desires to communicate with American manufacturers of clothing for women, knited underwear, hosiery, etc., with a view to securing an exclusive agency for these lines.

Paper hosiery, underwear, etc., No. 17442: A firm in Brazil requests assistance in obtaining representation of American manufacturers of hosiery, cotton and woolen underwear for men, cravat cloth and aluminum accessories for cravats, cloth labels for shirts and tailors' products, corset cloths and copper accessories.

Cotton sacks and cloth for sacks, No. 17556: An American consular officer in France transmits a detailed report relative to a market for cotton sacks and cloth for making sacks.

Cotton goods, No. 17116: A manufacturer's agent in Australia desires to obtain an agency for American cotton goods.

Cassimeres, alpacas and trousering materials, No. 17439: A firm in Central America has written an American manufacturing association that it desires samples and prices on cassimeres, alpacas, and trousering materials.

TREASURY DECISIONS

T. D. 35537. June 18, 1915. Drawback on hosiery. T. D. 35429 of May 24, 1914, extended to cover hosiery manufactured by the Oakbrook Hosiery Mills, of Reading, Pa., with the use of imported artificial silk yarn.

T. D. 35541—G. A. 7741. June 15, 1915. Mohair coat linings. Congress in separating goods consisting of or manufactured from Angora goat hair and goods made of wool, in Schedule K of the act of 1913, intended to tax under the separate Angora goat hair provisions (paragraphs 305, 306, 307, 308 and 309) every species of merchandise made of Angora goat hair which is covered by the terms of those paragraphs; and therefore coat linings in chief value of Angora goat hair are properly classified under paragraph 308 at 40 per cent. ad valorem, rather than under paragraph 290 as coat linings composed wholly or in chief value of wool. Crimmins & Pierce v. United States. In the matter of protest 751282 of S. Rosenberg & Co. against the assessment of duty by the collector of customs at the port of New York.

T. D. 35545. Drawback on artificial silk yarn. June 22, 1915. Drawback on artificial silk yarn imported in the gray and dyed and finished by the William Teschemacher Co., of Brooklyn, N Y., for account of the Luster Fibres, Ltd.

T. D. 35547. June 24, 1915. Drawback on hosiery. Drawback on hosiery manufactured by the Maybaum Mfg. Co., of Philadelphia, Pa., with the use of imported cotton yarn and artificial silk.

T. D. 35558. June 29, 1915. Drawback on yarn. Drawback on yarn manufactured by the Griswold Worsted Co., of Darby, Pa., in whole or in part with the use of imported mohair.

T. D. 35560. June 30, 1915. Drawback on veilings. Drawback on imported plain veilings, nettings, chiffons, Malines and similar materials man-

ufactured by various concerns for the account of Stern & Stern, of New York, by the process of printing, dotting, flocking, chenilling or hemstitching.

T. D. 35566. July 1, 1915. Drawback on Habutai silk. Drawback on Habutai silk dyed and finished by various manufacturers for the account of J. R. Simon & Co., New York.

Recent Textile Patents

BLEACHING, Preparing Textile Materials for. 1,143,543. James L. Jardine, Penicuik, Scotland.

BOBBIN CLEANING Mechanism. 1,145,000. Daniel L. Chandler, Ayer, Mass.

BOBBIN or Quill Stripping Machine. 1,144,006. Charles S. Smart, Cooleemee, N. C.

BRAIDING MACHINE. 1,144,716. Jacob Lundgren, Philadelphia, Pa.

DOBBY PATTERN Cylinder. 1,145,677. Albert A. Gordon, Jr., Worcester, Mass.

DYEING and Like Machinery, Compact. 1,145,858. John Brandwood, Bury, Eng.

FABRIC CUTTING Device. 1,143,594. Henry Fuhry, Milwaukee, Wis.

FABRIC TRIMMING Machine. 1,144,319. Gustave L. Bourquin, Perkasie, Pa.

GARMENT, Combination. 1,143,228. Edward J. Quigley, Newark, N. J.

GARMENT, Sleeping. 1,143,282. Edward P. Kind, Painesville, O.

KNITTED GARMENT. 1,145,402. Horace A. Carter, Needham Heights, Mass.

KNIT GOODS, Method of and Means for Producing Stripes in. 1,145,522. John Tebbutt, Florence, Mass.

KNITTING MACHINE. 1,143,552. Edison E. Randall, Kankakee, Ill.

KNITTING MACHINE. 1,144,846. Willis A. Ingalls, Cleveland, O.

KNITTING MACHINE Attachment. 1,143,658. William J. Steere, Rockwood, Tenn.

KNITTING MACHINE, Circular. 1,145,101. Everett H. Walker, Lowell, Mass.

KNITTING MACHINE Stop Mechanism. 1,144,273. Frank B. Wildman, Norristown, Pa.

LOOM. 1,145,425. Charles B. Lane, Knoxville, Tenn.

LOOM. 1,145,124. Samuel B. Cutting, Bridgeport, Conn.

LOOM SHUTTLE. 1,145,651. Robert N. Allen, Methuen, Mass.

LOOM WARP Stop Motion. 1,143,120. Simeon S. Jackson, Boston, Mass.

LOOM, Weft Replenishing. 1,142,937. Randolph Crompton, Chatham, Mass.

LOOM, Weft Replenishing Color. 1,142,938. Randolph Crompton, Chatham, Mass.

LOOM, Weft Replenishing. 1,144,946. Eppa H. Ryon, Waltham, Mass.

LOOMS, Multipler for. 1,145,030. Harmon O. Nelson, Whitinsville, Mass.

PILE FABRIC, Woven. 1,143,192. Fritz Hammer, Philadelphia, Pa.

SHUTTLE. 1,144,178. George A. Donaldson, Girard, Ill.

SHUTTLE POSITIONING Means. 1,143,105. Randolph Crompton, Chatham, Mass.

SHUTTLE, Self-Threading. 1,145,649. Robert N. Allen, Methuen, Mass.

SHUTTLES, Bobbin Clamp for. 1,145,650. Robert N. Allen, Methuen, Mass.

SHUTTLES, Loom. 1,145,651. Robert N. Allen, Methuen, Mass.

SPINNING FRAME and the Like. Roving-Creel for. 1,144,720. Albert H. Morton, Lowell, Mass.

SPINNING MULES. Means for Cross Winding Yarn in. 1,144,652. Henry S. Golland, Manchester, Eng.

SPINDLE. 1,144,394. Joseph Therbault, Central Falls, R. I.

STITCHING MACHINES, Attachment for Shell. 1,144,810. Franklin Chatfield, Minneapolis, Minn.

STITCHING MACHINES, Fabric Guide for. 1,144,811. Franklin Chatfield, Minneapolis, Minn.

THREAD-DRAWING Machine. 1,145,092. Charles R. Swain, Richmond Hill, N. Y.

THREAD ROLLING Device. 1,145,661. Archer N. Bailey, Torrington, Conn.

UNDERGARMENT. 1,144,616. Francis M. Shipley, Piqua, O.

UNDERGARMENT. 1,143,444. William R. Schremp, New York.

WARP LEASING Machine. 1,145,322. Charles D. Lanning, Dorchester, Mass.

WINDING MACHINE Controlling Device. 1,143,003. John W. West, East Braintree, Mass.

YARN CLEANING Apparatus. 1,144,864. Emil Prein, Hanover, Germany.

YARNS, HOSIERY and Weavings, Producing Melange-Like Dyed. 1,145,846. Gustav R. Pester, Wittgensdorf, near Chemnitz, Germany.

TEXTILE TRADE-MARKS RECENTLY FILED FOR REGISTRATION

82,681. Cotton piece goods. Mark: Stifel Junior. Owner: J. L. Stifel & Sons, Wheeling, W. Va.

83,890. Cotton piece goods. Mark: Balsam. Owner: York Mfg. Co., Saco, Me.

83,916. Cotton piece goods. Mark: Yorway. Owner: York Mfg. Co., Saco, Me.

84,053. Ladies' fichus. Mark: "Betsy Ross". Owner: Timothy F. Crowley, New York.

84,540. Clothing. Mark: The Tipperary. Owner: S. L. Silver & Co. New York.

84,732. Collars, silks, chiffons, etc. Mark: "Pickwick." Owner: Timothy F. Crowley, New York.

76,281. Lining fabrics. Mark: Sol Satin. Owner: S. M. Hexter & Co., Cleveland, O.

84,069. Silk, cotton, artificial silk yarn and thread. Mark: Cordichet. Owner: H. E. Verran Co., New York.

84,535. Shirts for men. Mark: National. Owner: National Dollar Shirt Shops, New York.

84,554. Silk dress goods. Mark: Samovari. Owner: Haas Bros., New York.

85,051. Velvets and plushes in the piece. Mark: Veltex. Owner: The Salt's Textile Mfg. Co., Bridgeport, Conn.

85,136. Hosiery. Mark: Fibertex. Owner: Holeproof Hosiery Co., Milwaukee, Wis.

85,206. Yarns and threads. Mark: Cordex. Owner: Dexter Yarn Co., Pawtucket, R. I.

85,209. Plushes in the piece. Mark: Balseal. Owner: The Hind & Harrison Plush Co., New York.

85239. Cotton piece goods. Mark: Uweara. Owner: M. M. V. Co., Huntsville, Ala.

85,273. Plushes in the piece. Mark: Hudseal. Owner: The Hind & Harrison Plush Co., New York.

75,728. Wool tops. Mark: Always on the Top. Owner: Middlebrook Wool Combing Co., East Boston, Mass.

82,202. Waterproof fabric. Mark: Zama. Owner: British American Manufacturing Co., Springdale, Conn.

83,341. Woven belting. Mark: "Alfalfa." Owner: Ernest L. Burrell, Chicago, Ill.

83,856. Athletic knit goods. Mark: Picture of man. Owner: Hygienic Fleeced Undedwear Co., Philadelphia, Pa.

84,657. Clothing. Mark: Smartset. Owner: Benjamin L. Herman, Hackensack, N. J.

84,673. Silk piece goods. Mark: Lunette. Owner: Wechsler-Barber Silk Co., Paterson, N. J.

84,674. Silk piece goods. Mark: Wexbar Silks. Owner: Wechsler-Barber Silk Co., Paterson, N. J.

84,809. Cotton piece goods. Mark: Peaches and Cream. Owner: The Carl Co., Schenectady, N. Y.

85,031. Waterproof fabric. Mark: Styma. Owner: British American Mfg. Co., Springdale, O.

85,355. Men's outer shirts. Mark: Alexo. Owner: Alexander & Co., New York.

85,416. Ladies' coats and suits. Mark: The Hussar. Owner: S. L. Silver & Co., New York.

84,606. Broad silk piece goods. Mark: Toile Rustique. Owner: Suplan Silk Co., New York.

84,975. Handkerchiefs. Mark: E sold Z. Owner: Harden Carter Co., New York.

85,044. Ribbons. Mark: American Maid. Owner: Ernest & Herman Levy, New York.

85,045. Hosiery and underwear. Mark: Picador Brand. Owner: Picador Hosiery Co., Philadelphia, Pa.

85,138. Plushes in the piece. Mark: Uralam. Owner: The Hind & Harrison Plush Co., New York.

83,322. Braids. Mark: Jewel. Owner: Rhode Island Textile Co., Pawtucket, R. I.

85,333. Plushes. Mark: Ukonseal. Owner: The Hind & Harrison Plush Co., New York.

85,370. Plushes. Mark: Cordseal. Owner: The Hind & Harrison Plush Co., New York.

85,483. Cotton piece goods. Mark: Buttercup. Owner: Lorraine Mfg. Co., Saylesville, R. I.

85,402. Plushes. Mark: Bafinseal. Owner: The Hind & Harrison Plush Co, New York.

85,571. Plushes. Mark: Klonseal. Owner: The Hind & Harrison Plush Co., New York.

85,683. Cotton piece goods. Mark: Top Notch. Owner: Grinnell, Willis & Co., New York.

76,993. Nainsook. Mark: Family. Owner: King Philip Mills, Fall River, Mass.

83,199. Nainsook. Mark: Cherry Blossom. Owner: King Philip Mills, Fall River, Mass.

83,841. Women's underclothing. Mark: Truso. Owner: Guy D. Sisson Co., Los Angeles, Cal.

83,896. Hosiery. Mark: Doubble Duty. Owner: Defiance Sock Mills, Charlotte, N. C.

85,624. Sweaters, leggings, etc. Mark: Snow King. Owner: American Knitting Co., Waltham, Mass.

85,952. Cotton piece goods. Mark: Voylene. Owner: York Mfg. Co., Saco, Me.

86,023. Cotton piece goods. Mark: Value. Owner: Victor Mfg. Co., Greensville, S. C.

75,343. Knitted underclothing. Mark: Body Guard. Owner: Robert Rowley & Co., Leicester, Eng.

78,813. Cotton piece goods and napkins. Mark: Indian Head. Owner: Jackson Co., Nashua, N. H.

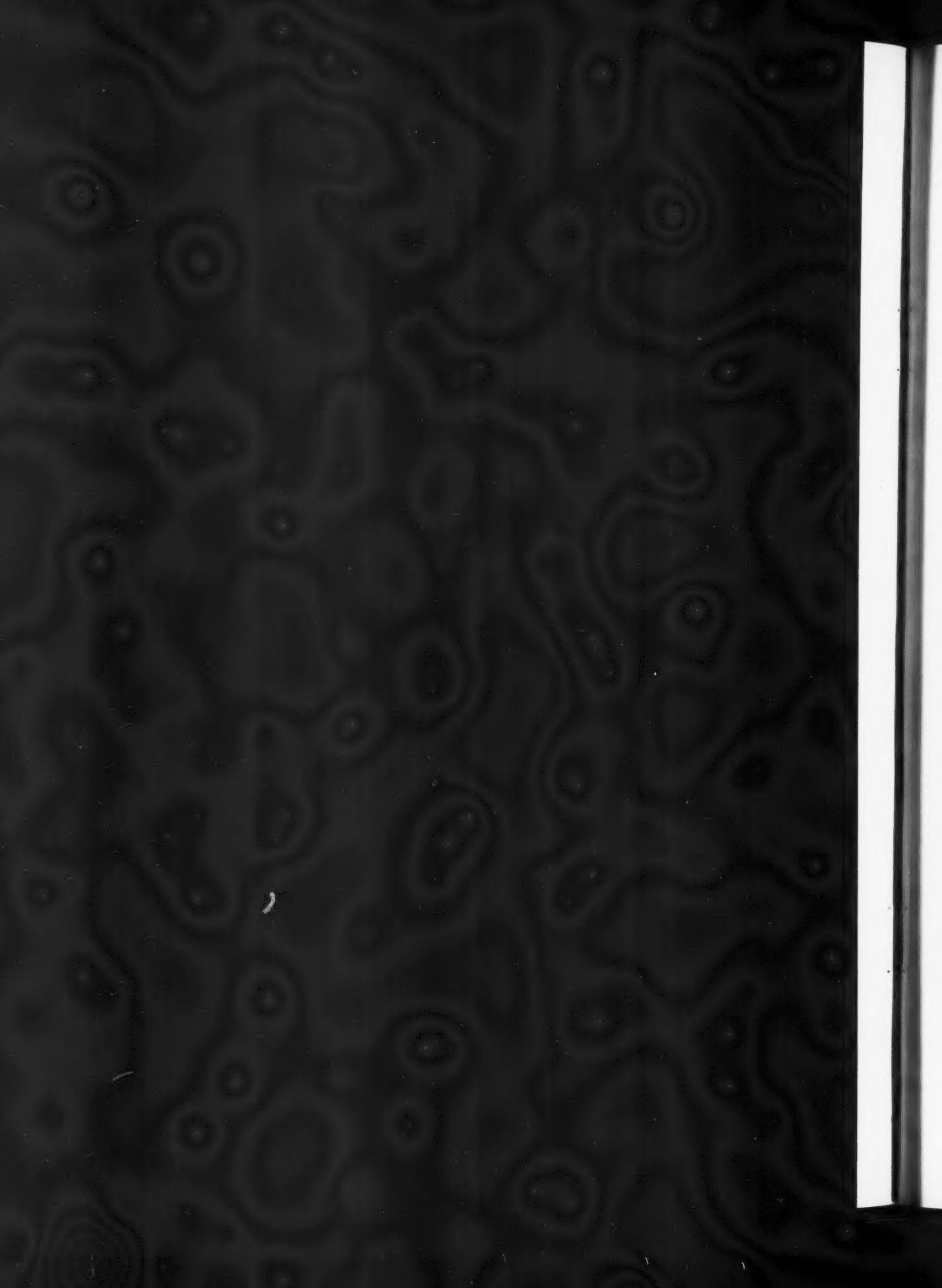
81,643. Cotton piece goods. Mark: Soudanese Moire. Owner: The Millville Mfg. Co., Philadelphia, Pa.

84,647. Cotton and wool piece goods. Mark: Breezweve. Owner: Currick, Leiken & Bandler. New York.

84,899. Woolen and worsted piece goods. Mark: Wooleather. Owner: Forstmann & Huffmann Co., Passaic, N. J.

85,754. Knitted union suits. Mark: Munsingwear. Owner: The Northwestern Knitting Co., Minneapolis, Minn.

86,143. Cotton piece goods. Mark: Walhalla. Owner: Monaghan Mills, Greenville, S. C.



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DIRECT IMPORTERS OF EGYPTIAN COTTON

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Thomas Broadbent & Sons,

Huddersfield, Eng.

PATENT DIRECT STEAM DRIVEN

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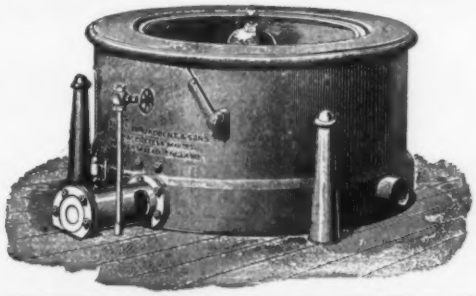

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In the Manufacture of
DYEING, BLEACHING and SCOURING MACHINES

DURABLE K-W UNIVERSALLY USED

THE fact that Klauder-Weldon machines have always been recognized as the standard of economic efficiency in Dyeing, Bleaching and Scouring is sufficient reason to believe that they have merits that justify your most careful investigation.

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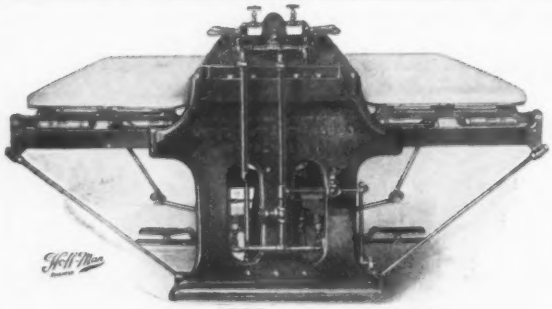
PROVIDENCE, R. I. Office
Case Mead Building

Foreign Plant
HUDDERSFIELD, ENGLAND



HOFFMAN FFF MODEL PATENTED

Stephenson Underwear Mills of South Bend, Ind., express themselves in part as follows:

"We feel quite willing to express our confidence in your FFF Hoffman Press as we have two in constant use and

The Third just received and partly erected."

The Direct Application of Hot Dry Steam as Applied to Knit Goods by the Hoffman Principle Improves the Appearance

United States Hoffman Co., Syracuse, N. Y.

Buyers' Index

This department is conducted for the benefit of our subscribers. The addresses of builders of mill machinery and dealers in mill supplies, whose names appear in the following classified index, may be found upon referring to their advertisements. The Alphabetical Index to advertisers follows this classified list. Buyers who are unable to find in the classification here given such machinery or supplies as they desire, are invited to communicate with the publishers, who can, in all probability, refer them to proper sources. Advertisers whose names do not appear under headings to which they are entitled will please notify the publishers.

Absorbent Cotton Wool Machinery.
Tatham, William, Ltd.

Air Moistening System.
——See Humidifying Apparatus.

Albone.
Roessler & Hasslacher Chemical Co.

Architects and Mill Engineers.
Cramer, Stuart W.
Dyer, W. E. S.
Ferguson, John W.
Main, Charles T.
Myrick, J. W. H.

Asbestos Covering.
Johns-Manville Co., H. W.

Asbestos Products.
Johns-Manville Co., H. W.

Ash Handling Equipment.
Green Engineering Co.
Sturtevant, B. F., Co.

Asphalt Tanks.
Scaife, W. B., & Sons.

Automatic Feeds for Cotton and Wool.
Leigh & Butler.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Saco-Lowell Shops.
Sargent's, C. G., Sons.
Schofield, Wm., Co.
Smith & Furbush Mch. Co.
Tatham, William, Ltd.
Woonsocket Machine & Press Co.

Back Filling.
International Pulp Co.

Bale Presses.
Saco-Lowell Shops.

Baling Presses.
Boomer & Boschert Press Co.
Philadelphia Drying Mchy. Co.
Smith & Furbush Mch. Co.

Ballers.
Saco-Lowell Shops.

Ball Bearings.
S. K. F. Ball Bearing Co.

Bandings.
Lambeth Rope Corporation.
Sternberg, Fred, & Co.

Baskets.
Diamond State Fibre Co.
Lane, W. T., & Bro.
Standard Fibre Co.

Beamers.
Crompton & Knowles Loom Works.

Bearings.
——See Ball Bearings, Oil-less Bearings and Roller Bearings.

Belting.
Bond, Charles, Co.
Gandy Belting Co.
Graton & Knight Mfg. Co.
Hood, R. H., Co.
Johns-Manville Co., H. W.
Schieren, Chas. A., Co.
Williams, I. B., & Sons.
——See also Mill Supplies.

Belting, Leather.
Graton & Knight Mfg. Co.
Schieren, Chas. A., Co.

Belting, Link.
Graton & Knight Mfg. Co.
Schieren, Chas. A., Co.

Belt Cement.
Graton & Knight Mfg. Co.
Schieren, Chas. A., Co.

Belt Dressing.
Graton & Knight Mfg. Co.
Schieren, Chas. A., Co.
Stephenson Mfg. Co.

Belt Lacing, Leather.
Graton & Knight Mfg. Co.
Schieren, Chas. A., Co.

Belt Tighteners.
Hunter, James, Machine Co.

Bindings.
——See Tapes and Braids.

Bleaching Kiers.
Birch Bros. (Albert Birch, prop.).
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
New England Tank & Tower Co.
Philadelphia Drying Machinery Co.
Stearns Lumber Co., A. T.
Textile-Finishing Machinery Co.

Bleaching Materials.
Bosson & Lane.
Electro Bleaching Gas Co.
Roessler & Hasslacher Chemical Co.
Seydel Mfg. Co., The.
Wolf, Jacques & Co.
Worden Chemical Works.

Blowers and Blower Systems.
Autoforce Ventilating System.
Buffalo Forge Co.
Carrier Air Conditioning Co.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.

Bobbins, Spools, Shuttles, Etc.
American Supply Co.
Kunze, Otto.
Leigh & Butler.
Tebbets, E. L., Spool Co.

Bobbin Winders.
Altemus, J. K.
Lever, Oswald, Co.
Universal Winding Co.

Boilers.
——See Steam Boilers.

Boxes, Box Shooks, Etc.
Diamond State Fibre Co.
Pearson, J. T.
Standard Fibre Co.

Braiding Machinery.
New England Butt Co.
Textile Machine Works.

Braids.
——See Tapes, Braids and Edgings.

Brass Hinges.
Root, C. J., Co.

Bridges.
Scaife, W. B., & Sons.

Brushers.
——See Napping Machines.

Brushes.
Cocker, M., & Co.
Felton, S. A., & Son Co.
Parks & Woolson Machine Co.

Brushing Machines.
Buhlmann, A. W.
Parks & Woolson Machine Co.

Burr Pickers.
Curtis & Marble Machine Co.
Sargent's, C. G., Sons.
Smith & Furbush Machine Co.

Button Sewing Machines.
Union Button Sewing Co.

Calico Printers' Machinery and Supplies.
Birch Bros., Somerville Mach. Wks.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Schwartz, L. H. A., & Co.
Somerville Mach. Wks. (Albert Birch, prop.).
Taunton-New Bedford Copper Co.
Textile-Finishing Machinery Co.
——See also Dyeing, Drying, Bleaching, Machinery, etc.

Canvas Baskets.
Lane, W. T., & Bro.

Carbonizing Machinery.
Birch Bros., Somerville Mach. Wks.
Buhlmann, A. W.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Schwartz, L. H. A., & Co.
Somerville Mach. Works (Albert Birch, prop.).
Textile-Finishing Machinery Co
Tolhurst Machine Works.

Card Clothing.
Ashworth Bros.
Atkinson, Haserick & Co.
Buhlmann, A. W.
Firth, William, Co.
H. & B. American Machine Co.
Leigh & Butler.
Riley, C. E., Company.
Schwartz, L. H. A., & Co.

Card Feeds.
——See Automatic Feeds.

Card Grinding Machinery.
Atkinson, Haserick & Co.
Buhlmann, A. W.
Dronsfield Bros.
Entwistle, T. C., Co.
Firth, William, Co.
Fraser, Douglas & Sons, Ltd.
Leigh & Butler.
Riley, C. E., Company.
Smith & Furbush Machine Co.

Card Leather.
Graton & Knight Mfg. Co.

Carding Machinery.
Fraser, Douglas & Sons, Ltd.
Saco-Lowell Shops.
Smith & Furbush Mch. Co.
Tatham, William, Ltd.

Card Stampers and Repeaters.
Hodgson, Walter W.

Carpet Machinery.
Altemus, Jacob K.
Crompton & Knowles Loom Works.
Curtis & Marble Machine Co.
Parks & Woolson Machine Co.
Philadelphia Textile Machinery Co.
Smith & Furbush Machine Co.
Textile-Finishing Machinery Co.

Carrier Aprons.
Graton & Knight Mfg. Co.

Castings.
Decatur Fndry, Furnace & Mch. Co.
Fairbairn, Lawson, Combe, Barbour, Ltd.
Hunter, James, Machine Co.
Lunkenheimer Co., The.
Royersford Foundry & Machine Co.
Schofield, Wm., Co.

Caustic Soda.
Wing & Evans.

Cement Pans.
Scaife, W. B., & Sons.

Centrifugal Filters.
Watson, Laidlow & Co., Ltd.
Wayte, W. J., Inc.

Centrifugal Machines.
Schaum & Uhlinger, Inc.
Watson, Laidlow & Co., Ltd.
Wayte, W. J., Inc.

Chain Belts.
Morse Chain Co.

Chains, Power Transmission.
Morse Chain Co. (Silent Driving).

Chemists.
Little, Arthur D., Inc.
Lunkenheimer Co., The.

Chenille Machinery.
Eppler, John, Machine Works.

Clocks.
Pettes & Randall Co.

Cloth Boards.
Chaffee Bros.
Pearson, J. T.
Richardson Brothers.
Textile-Finishing Machinery Co.

Cloth Cutting Machines.
Eastman Machine Co.
Firth, William, Co.
Oswego Machine Works.

Alphabetical Index to Advertisers, with page numbers, follows this list.

Cloth Doubling Machinery.
Curtis & Marble Machine Co.
Parks & Woolson Machine Co.

Cloth Dryers.
——See Drying Machinery.
Weinerth Knitting & Machine Co.

Cloth Expanders.
Birch Bros. Somerville Machine Wks. (Albert Birch, prop.).
Leyland, Thomas, & Co.
Somerville Mach. Wks. (Albert Birch, prop.).

Cloth Shrinking Machinery.
Reliance Machine Works.

Cloth Testers.
Perkins, B. F., & Son, Inc.
Scott, H. L., & Co.
Suter, Alfred.

Cloth Winders.
Firsching, J. A.
Ireland Machine & Foundry Co.
Parks & Woolson Machine Co.

Clutches.
Decatur Fndry, Furnace & Mch. Co.
Hunter, James, Machine Co.

Coal Analysis.
Little, A. D., Inc.

Collars (Shaft).
Royersford Foundry & Machine Co.

Comb Aprons.
Graton & Knight Mfg. Co.

Combs (Wool and Cotton).
Atkinson, Haserick & Co.
Crompton & Knowles Loom Works.
Entwistle, T. C., Co.
Firth, William, Co.
Hood, R. H., Company.
Leigh & Butler.
Riley, C. E., Company.

Commercial Vehicles.
Kissel Motor Car Co.
Pierce Arrow Motor Car Co.

Compressors (Air).
Allis-Chalmers Mfg. Co.
General Electric Co.

Condensers.
Allis-Chalmers Mfg. Co.
Buffalo Steam Pump Co.
Dodge, C. S.

Conditioning and Testing.
U. S. Conditioning & Testing Co.

Conditioning Machines.
Buhlman, A. W.
Manufacturers Machine Co.
Parks & Woolson Machine Co.

Cones (Paper).
American Paper Bobbin Co., Inc.
Pairpoint Corporation.

Conveying Systems.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Conveyor Belting
Gandy Belting Co.

Conveyors, Gravity.
Otis Elevator Co.

Coolers (Air).
Power Specialty Co.

Cop Machinery.
Eppler, John, Machine Works.

Cop Spindles.
American Textile Specialty Co.

Cop Tubes.
Pairpoint Corporation.
——See Paper Tubes.

Copper Expansion Joints.
Badger, E. B., & Sons Co.

Copper Print Rollers.
Taunton-New Bedford Copper Co.

Coppersmiths.
Badger, E. B., & Sons Co.
Butterworth, H. W., & Sons Co.
Textile-Finishing Machnery Co.

Copper Work for Dyers.
Badger, E. B., & Sons Co.
Butterworth, H. W., & Sons Co.
Textile-Finishing Machinery Co.

Corduroy and Velvet Cutting Machines.
Firth, William, Co.

Corrugated Iron and Steel.
Scaife, W. B., & Sons.

Cotton.
Riley, C. E., Company.
Schwartz, L. H. A., & Co.

Cotton Dryers.
——See Drying Machinery.

Cotton Machinery.
Ashworth Bros.
Atkinson, Haserick & Co.
Barber-Colman Co.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Cramer, Stuart W.
Crompton & Knowles Loom Works.
Curtis & Marble Machine Co.
Dixon Lubricating Saddle Co.
Draper Company.
Elliott & Hall.
H & B. American Machine Co.
Klauder-Weldon Dyeing Mch. Co.
Leigh & Butler.
Mason Machine Works.
Metallic Drawing Roll Co., The.
Parks & Woolson Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Riley, C. E., Company.
Saco-Lowell Shops.
Schwartz, L. H. A., & Co.
Smith & Furbush Machine Co.
Stafford Co., The.
Tatham, William, Ltd.
Textile-Finishing Machinery Co.
Textile Machinery Co.
Wildman Mfg. Co.
Woonsocket Mch. & Press Co.

Cotton Openers and Lappers.
Atkinson, Haserick & Co.
Firth, William, Co.
Hetherington, John & Sons, Ltd.
H. & B. American Machine Co.
Leigh & Butler.
Pettier & Johnston Mch. Co.
Riley, C. E., Company.
Saco-Lowell Shops.

Cotton Softeners.
Bosson & Lane.
Harding & Fancourt, Inc.
Seydel Mfg. Co., The.
Wolf, Jacques & Co.

Cotton Waste Machinery.
Firth, William, Co.
Saco-Lowell Shops.
Smith & Furbush Mch. Co.
Tatham, William, Ltd.

Counting Machines.
Durant Manufacturing Co.
National Scale Co.
Root, C. J., & Co.

Couplings (Flexible-Insulated).
Bond Co., Charles.

Couplings (Shaft).
Royersford Foundry & Machine Co.

Crayons.
American Crayon Co.
Lowell Crayon Co.

Cutting Machines.
Eastman Machine Co.
Firsching, J. A.
Ireland Machine & Foundry Co.
Oswego Machine Works.
Perkins, B. F., & Son, Inc.
Weinerth Knitting & Machine Co.

Cylinder Oil (Superheated Steam).
Power Specialty Co.

Decating Machinery.
Buhlmann, A. W.
Parks & Woolson Machine Co.
Schwartz, L. H. A., & Co.

Disinfectants.
Seydel Mfg. Co., The.

Dobbies.
Crompton & Knowles Loom Works.
Halton's, Thomas, Sons.
Stafford Co., The.

Drawing Rolls.
Hood, R. H., Company.
H. & B. American Machine Co.
Metallic Drawing Roll Co.

Drinking Fountains.
Johns-Manville Co., H. W.
Puro Sanitary Drinking Fountain Co.
Rundle-Spence Mfg. Co.

Drives, Silent Chain.
Morse Chain Co.

Drop Wires.
Connecticut Mill Supply Co.

Drying Boards.
Pearson, J. T.
Philadelphia Drying Mchy. Co.

Drying Machinery.
Bailey, Frank.
Birch, Albert, Somerville Mach. Wks.
Birch Bros., Somerville Mach. Wks.
Buffalo Forge Co.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Consolidated Hospital Sup. & Laundry Machinery Co.
Decatur Fndry, Furnace & Mch. Co.
Hunter, Jas., Machine Co.
Kenyon, D. R., & Son.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Schwartz, L. H. A., & Co.
Somerville Mach. Wks. (Albert Birch, prop.).
Sturtevant, B. F., Co.
Textile-Finishing Machinery Co.
Tolhurst Machine Works.

Dusters.
——See Wool and Waste Dusters.

Dust Collectors.
Buffalo Forge Co.
Buffalo Steam Pump Co.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.

Dyers Clogs.
Brown, Wm., Sons.

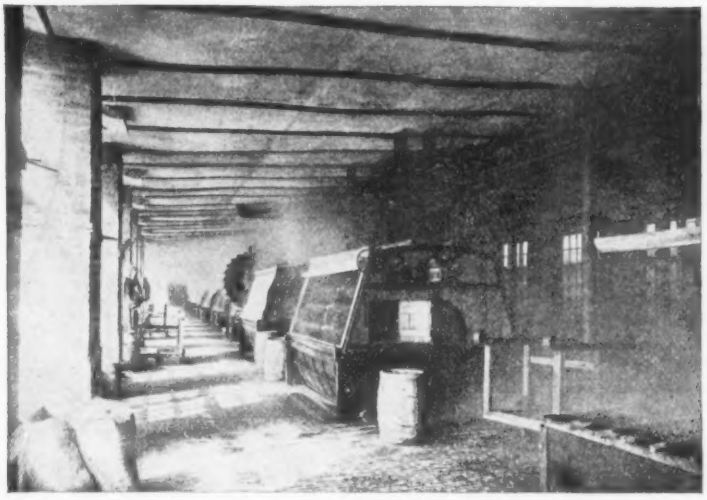
Dyers, Bleachers and Finishers.
Aberfoyle Mfg. Co.
Brophy's, T., Sons.
Davidson, John F.
Franklin Process Co.
Globe Dye Works Co.
Home Bleach & Dye Works.
Hopkinson Dyeing & Textile Wks.
National Silk Dyeing Co.
Peerless Co.
Utica Willowvale Bleaching Co.

Dyeing, Drying, Bleaching and Finishing Machinery.
American Laundry Machinery Co.
Autoforce Ventilating System.
Birch, Albert, Somerville Mach. Wks.
Birch Bros., Somerville Mach. Wks.
Buffalo Forge Co.
Buffalo Steam Pump Co.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Consolidated Hospital Sup. & Laundry Machinery Co.
Curtis & Marble Machine Co.
Franklin Process Co.
Giles, J. H., Dyeing Machine Co.
Heathcote, John, & Son.
Klipstein, A., & Co.
Hunt, Rodney, Mach. Co.
Hunter, James, Machine Co.
Hussong Dyeing Machine Co.
Kenyon, D. R., & Son.
Klauder-Weldon Dyeing Mch. Co.
Leigh & Butler.
Leyland, Thos., & Co.
Manufacturers Machine Co.
National Laundry Machinery Co.
Parks & Woolson Machine Co.
Perkins, B. F., & Son, Inc.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Reliance Machine Works.
Schwartz, L. H. A., & Co.
Smith, Drum & Co.
Somerville Mach. Wks. (Albert Birch, prop.).
Sturtevant, B. F., Co. (Drying).
Suter, Alfred.
Textile Finishing Machinery Co.
Tolhurst Machine Works.
Uniform Dyeing Machine Co.
U. S. Hoffman Co.

Dye House Cans.
Diamond State Fibre Co.
Hill, James, Mfg. Co.

Alphabetical Index to Advertisers, with page numbers, follows this list.

This Dye House Kept Clear of Steam



Interior of Dye House of a New England Textile Mill.—This is an exact reproduction of an unretouched photograph taken under operating conditions with all windows closed

The absence of steam and "fog," and the clear dry ceiling and windows are due to the

Sturtevant System
REG. U. S. PAT. OFF.

of Heating and Ventilating

which supplies an abundance of warm dry air to the dye house. This prevents condensation on roof and walls, and the consequent rotting of timbers.

The clear atmosphere permits better work and more of it. Inspection of the product is easier and defects that would not be noticed in a steam filled room will be seen quite readily. A Sturtevant System will clarify the atmosphere in your dye house and will keep your operators feeling "fit". The result will be higher efficiency, greater contentment, better work and more of it.

Why not write us and we will have an engineer who is thoroughly experienced in this work look over your plant and make recommendations. This will put you under no obligation.

B. F. Sturtevant Company
Hyde Park, - - Boston, Mass.
and all principal cities of the world

Dye House Trucks.
Bailey, Frank.
Diamond State Fibre Co.
New England Tank & Tower Co.

Dye Kettles.
New England Tank & Tower Co.
Stearns, A. T., Lumber Co.

Dye Sticks.
Bailey, Frank.
Klauder-Weldon Dyeing Mch. Co.
New England Tank & Tower Co.

Dye Tubs.
——See Tanks, Tubs and Vats.

Dyestuffs and Chemicals.
American Dyewood Co.
Atteaux, F. E., & Co.
Badische Co.
Bayer Co., The, Inc.
Berlin Aniline Works.
Bischoff & Co.
Bosson & Lane.
Cassella Color Co.
Electro Bleaching Gas Co.
Farbwerke-Hoechst Co.
Ford, J. B., Co.
Geisenheimer & Co.
Harding & Fancourt, Inc.
Holliday, Read & Sons.
Innis Speiden & Co.
Johnson, Chas. A., & Co.
Kalle Color & Chemical Co., Inc.
Klipstein, A., & Co.
Leyland, Thos., & Co.
National Aniline & Chemical Co.
Roessler & Hasslacher Chemical Co.
Seydel Mfg. Co.
Sizing Specialties Co.
Stein, Hirsh & Co.
Sykes, Walter F., & Co.
Thayer, Ed. M., & Co.
Wing & Evans, Inc.
Wolf, Jacques & Co.
Worden Chemical Co.

Dynamos.
——See Electric Lighting.

Edgings.
——See Tapes, Braids and Edgings.

Electrical Construction.
Allis-Chalmers Mfg. Co.
Crocker-Wheeler Co.
General Electric Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electric Heating Devices.
Crocker-Wheeler Co.
General Electric Co.

Electrical Supplies.
General Electric Co.
Johns-Manville Co., H. W.

Electric Driven Pumps.
Allis-Chalmers Mfg. Co.
Buffalo Steam Pump Co.
General Electric Co.

Electric Fans.
Allis-Chalmers Mfg. Co.
Buffalo Forge Co.
Buffalo Steam Pump Co.
Crocker-Wheeler Co.
General Electric Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electric Hoists.
Allis-Chalmers Mfg. Co.
Crocker-Wheeler Co.
General Electric Co.

Electric Lighting.
Allis-Chalmers Mfg. Co.
Cooper Hewitt Electric Co.
Crocker-Wheeler Co.
General Electric Co.
Johns-Manville Co., H. W.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electric Motors.
Allis-Chalmers Mfg. Co.
Crocker-Wheeler Co.
General Electric Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electrolyzer.
National Laundry Machinery Co.

Elevators.
Craig Ridgway & Son Co.
Decatur Fndry, Furnace & Mch. Co.
Economy Engineering Co.
N. Y. Revolving Portable Elevator Co.
Otis Elevator Co.
Salem Elevator Works.

Employes' Time Recorders.
Pettes & Randall Co.

Engineers (Ventilating).
Myrick, J. W. H.
Sturtevant, B. F., Co.

Engines (Steam, Oil, Gas).
Allis-Chalmers Mfg. Co.
Buffalo Forge Co.
Fairbairn, Lawson, Combe, Barbour, Ltd.
International Gas Engine Co.
International Steam Pump Co.
Snow Steam Pump Plant.
Sturtevant, B. F., Co.
Textile Finishing Machinery Co.

Exhaust Heads.
Power Specialty Co.
Sturtevant, B. F., Co.

Extractors.
American Laundry Machinery Co.
Atkinson, Haserick & Co.
Broadbent, Thomas, & Sons.
Riley, C. E., Co.
Schaum & Uhlinger, Inc.
Schwartz, L. H. A., & Co.
Tolhurst Machine Works.
Watson, Laidlow & Co., Ltd.
Wayte, W. J., Inc.

Fans—Exhaust and Ventilating.
——See Ventilating Apparatus.

Feed Water Heaters.
Scaife, W. B., & Sons.

Feed Water Pumps.
Blake & Knowles Steam Pump Works.
Buffalo Steam Pump Co.
Goulds Mfg. Co.

Feed Water Purifiers.
American Water Softener Co.
International Filter Co.
Scaife, W. B., & Sons.

Feeds.
——See Automatic Feeds.

Felt Rotary Washers.
Hunt, Rodney, Machine Co.

Felting Machinery.
Hunt, Rodney, Machine Co.
Smith & Furbush Machine Co.

Fender Boards.
Case Brothers.

Fibre Boxes.
Diamond State Fibre Co.
Standard Fibre Co.

Fibre Trucks.
Diamond State Fibre Co.
Standard Fibre Co.

Filters.
American Water Softener Co.
Hungerford & Terry.
International Filter Co.
Norwood Engineering Co.
Permutit Co.
Scaife, W. B., & Sons.

Finishing Compounds.
——See Sizings.

Finishing Machinery.
——See Dyeing, Drying, Bleaching and Fihishing.

Fire Alarms.
Pettes & Randall.

Fire Brick.
Borgner, Cyrus, Co.
Johns-Manville Co., H. W.

Fire Extinguishers.
Badger, E. B., & Sons Co.
Johns-Manville Co., H. W.

Fire Hose.
Eureka Fire Hose Co.

Fire Hydrants.
Norwood Engineering Co.

Fire Insurance.
Home Insurance Co.

Fire Proof Doors and Windows.
Badger, E. B., & Sons Co.

Flexible Metal Hose.
Johns-Manville Co., H. W.

Flow Meters, Steam.
General Electric Co.

Fluted Rolls.
Firth, William, Co.
Hood, R. H., Company.
H. & B. American Machine Co.
Leigh & Butler.
Metallic Drawing Roll Co.
Riley, C. E., Company.

Flyers.
Bodden, Wm., & Son, Ltd.
Firth, William, Co.
H. & B. American Machine Co.
Leigh & Butler.
Textile Machinery Co.

Forges.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Friction Clutches.
——See Clutches.

Friction Cones.
Evans Friction Cone Co.

Fuel Economizers.
Sturtevant, B. F., Co.

Fulling Mills for Woolen Goods.
American Laundry Machinery Co.
Hunt, Rodney, Mach. Co.
Hunter, James, Mach. Co.
Kenyon, D. R., & Son.

Garnetts.
Hunter, James, Machine Co.
Leigh & Butler.
Smith & Furbush Machine Co.

Garnetted Stock.
Graves, Frank B.

Gas Blowers and Exhausters.
Sturtevant, B. F., Co.

Gas Engines.
——See Engines.

Gas Systems.
Kemp Mfg. Co.

Gaskets (Superheated Steam).
Johns-Manville Co., H. W.
Power Specialty Co.

Gauges.
Lunkenheimer Co., The.

Gears.
Diamond State Fibre Co.
General Electric Co.
New Process Gear Corporation.

Gear Cutting Machine.
Whiton, The D. E., Co.

Gearing, Silent Flexible.
Morse Chain Co.

Generating Sets.
Allis-Chalmers Mfg. Co.
General Electric Co.
Sturtevant, B. F., Co.

Geyser Water Heater.
Sargent's Sons, C. G., Corp.

Greases.
Borne, Scrymser Co.
N. Y. & N. J. Lubricant Co.
Royersford Foundry & Machine Co.

Grinding and Polishing Machines.
Royersford Foundry & Machine Co

Gun Cotton Machinery.
Tatham, William, Ltd.

Hangers.
——See Power Transmission Machinery.

Hank Clocks.
Morton & Andrews.

Harness Twine.
Moore, C., & Co.

Harness and Frames.
Garland Mfg. Co.
Steel Heddle Mfg. Co.

Heating.
——See Ventilating Apparatus.

Heddles.
American Supply Co.
Atkinson, Haserick & Co.
Firth, William, Co.
Lavigne & Suter.
Steel Heddle Mfg. Co.

Hoists.
——See Engines, Hoisting.

Hoisting Apparatus.
Economy Engineering Co.
Hunt, Rodney, Machine Co.
N. Y. Revolving Portable Elevator Co.

Hose.
Johns-Manville Co., H. W.

Hose, Pneumatic.
Johns-Manville Co., H. W.
Parks, G. M., Co.

Hosiery Boards.
Pearson, J. T.
Philadelphia Drying Machinery Co.

Hosiery Labels.
Kaumagraph Co.

Alphabetical Index to Advertisers, with page numbers, follows this list.

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Angle
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Gate
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Boiler Stop
Pop Safety
Relief
Blow-off Pattern, etc.

Lubricators
Injectors
Ejectors
Oiling Devices
Grease Cups
Whistles
Oil Cups
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Gauge Cocks
Water Gauges
Low Water Alarms
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Automobile and Motor Boat Specialties, Etc.

Largest display of high grade engineering appliances ever exhibited.
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"QUALITY"

Largest Manufacturers of High Grade Engineerng Specialties in the World

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When You Order Loom Pickers Think of "Garland" Quality

No better rawhide can be obtained than that of which our rawhide loom pickers are made.

The hides are cured for us in England by one of the largest and best known curers in the world and we have absolutely the first selection from his stock. The best material and skillful workmanship are bound not only to produce the best results, but to maintain the standard of quality for which our rawhide loom pickers are so well known.

Remember, we guarantee every picker

G
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SACO, MAINE

Humidifying Apparatus.
American Moistening Co.
Carrier Engineering Corporation.
Cramer, Stuart W.
Parks, G. M.

Humidity Controller.
American Moistening Co.
Carrier Engineering Corporation.
Cramer, Stuart W.

Hydraulic Rams.
Power Specialty Co.

Hydro Extractors.
——See Extractors.

Insulating and Braiding Silks.
Sauquoit Silk Mfg. Co.

Insurance (Casualty, Fire and for Loss of Profits).
Home Insurance Co.
——See Liability Insurance.

Jacquards.
Crompton & Knowles Loom Works.
Halton's, Thomas, Sons.

Jacquard Cards.
Case Bros., Inc.

Knit Goods Dryers.
——See Drying Machinery.

Knit Goods, Edgings, Trimmings, Etc.
Chapin, George W.
Cheney Bros.
Friedberger-Aaron Mfg. Co.
Jenkins, E. Wheeler.
Krout & Fite Mfg. Co.
Weimar Bros.

Knit Goods, Finishing Machines, Crochet, Etc.
American Laundry Machinery Co.
Hunt, Rodney, Machine Co.
Merrow Machine Co., The.
Nye & Tredick Co.
Scott & Williams.
Spindler, E. O.
Union Special Machine Co.

Knitting Machine Cylinders.
Paxton & O'Neill.
Stafford & Holt.

Knitting Machinery.
Acme Knitting Machine & Needle Co.
Ainslie Knitting Machine Co.
Boss Knitting Machine Co.
Brinton, H., & Co.
Claes & Flentje.
Cooper, Charles.
Crane Mfg. Co.
Domestic Machinery Works.
Eppler, John, Machine Works.
Gormly, Robert.
Hemphill Mfg. Co.
Jenckes Knitting Machine Co.
Lamb Knitting Machine Co.
Leighton Machine Co.
Nye & Tredick Co.
Paxton & O'Neill.
Scott & Williams, Inc.
Spindler, E. O.
Stafford & Holt.
Standard Machine Co.
Textile Machine Works.
Tompkins Bros. Co.
Walther, Otto.
Wildman Mfg. Co.

Knitting Machinery (Full Fashioned).
Domestic Machinery Works.
Spindler, E. O.
Textile Machine Works.
Walther, Otto.

Knitting Needles and Supplies.
Acme Knitting Machine & Needle Co.
Breedon's, Wm., Sons.
Brinton, H., & Co.
Continental Latch Needle Co.
Cooper, Charles.
Crane Mfg. Co.
Excelsior Needle Co.
Ives, L. T., Co.
Keystone Latch Needle Co.
Lamb Knitting Machine Co.
Spindler, E. O.
Wardwell Needle Co.

Label Wire Stitchers.
Shoemaker, J. L., & Co.

Lace Leather.
Graton & Knight Mfg. Co.
Schieren, Chas. A., Co.

Lace Machines.
Spindler, E. O.

Laces.
Jenkins, E. Wheeler.

Lamps, Electric.
Cooper Hewitt Electric Co.
General Electric Co.
Johns-Manville Co., H. W.
Westinghouse Electric & Mfg. Co.

Leather Packings.
Graton & Knight Mfg. Co.
Schieren, Chas. A., Co.

Liquid Chlorine.
Electro Bleaching Gas Co.

Loom Harness Straps.
Graton & Knight Mfg. Co.

Loom Pickers.
Garland Mfg. Co.
Graton & Knight Mfg. Co.

Looms.
Atkinson, Haserick & Co.
Buhlmann, A. W.
Crompton & Knowles Loom Works.
Draper Company.
Leigh & Butler.
Mason Machine Works.
Saco-Lowell Shops.
Stafford Co., The.

Loopers.
Hepworth, John W., & Co.
Leighton Machine Co.

Lubricants.
Borne, Scrymser Co.
N. Y. & N. J. Lubricant Co.
Royersford Foundry & Machine Co.
S. K. F. Ball Bearing Co.

Lubricators.
Lunkenheimer Co.

Lug Straps.
Graton & Knight Mfg. Co.

Lumpers.
Dodge, C. S. (and Willowers).
Gerry, George, & Son.
Schofield, William, Co.

Machinists' Tools.
Whiton, The D. E., Co.

Magnesia Products.
Johns-Manville Co., H. W.

Mangles.
American Laundry Machinery Co.

Marking Pots.
Bradley, A. J.

Mattress Machinery.
Dodge, C. S.

Measuring and Folding Machines.
Curtis & Marble Machine Co.
Elliot & Hall.
Parks & Woolson Machine Co.

Mechanical Draft.
Buffalo Forge Co.
Buffalo Steam Pump Co.
Sturtevant, B. F., Co.

Mechanical Draughtsmen.
Sturtevant, B. F., Co.

Mechanical Engineers.
Buffalo Forge Co.
Myrick, J. W. H.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.

Mercerizers.
Globe Dye Works.
Home Bleach & Dye Works.

Mercerizing Machinery.
Buhlmann, A. W.
Butterworth, H. W., & Sons.
Klauder-Weldon Dyeing Mach. Co.
Schwartz, L. H. A., & Co.
Smith, Drum & Co.
Textile-Finishing Machinery Co.
Wolf, Jacques & Co.

Metallic Fire-Proof Window Frames and Sashes.
Badger, E. B., & Sons Co.

Metallic Packing.
Power Specialty Co.

Metallic Rolls.
Metallic Drawing Roll Co.

Mill Architects.
——See Architects and Mill Engineers.

Mill Builders and Engineers.
Dean, F. W., Inc.
Ferguson, John W.
Main, Charles T.

Mill Piping.
Parks Co., G. M.

Mill Supplies.
American Supply Co.
Atkinson, Haserick & Co.
Bamford & Smith.
Bond, Charles, Co.
Brown's, Wm., Sons.
Buckley's, Benjamin, Sons.
Connecticut Mill Supply Co.
Eureka Fire Hose Co.
Fairbairn, Lawson, Combe, Barbour, Ltd.
Firth, William, Co.
Garland Mfg. Co.
Graphite Lubricating Co.
Graton & Knight Mfg. Co.
Hood, R. H., Co.
Jones & Hardy.
Kunze, Otto.
Lane, W. T., & Bro.
Leigh & Butler.
Lunkenheimer Co.
N. Y. & N. J. Lubricant Co.
Fairpoint Corporation.
Philadelphia Drying Machinery Co.
Powell, Wm., Co.
Richardson Bros.
Riley, C. E., Company.
Stephenson Mfg. Co.

Millwrights.
Hunter, James, Machine Co.

Moth Exterminator.
Berlin Aniline Works.

Motors.
——See Electric Motors.

Motor Trucks.
Kissel Motor Car Co.
Pierce Arrow Motor Car Co.

Napping Machinery.
Birch Bros., Somerville Mach. Wks.
Buhlmann, A. W.
Curtis & Marble Machine Co.
Leigh & Butler.
Parks & Woolson Machine Co.
Schwartz, L. H. A., & Co.

Netting Machines.
Spindler, E. O.

Noils (Silk).
Ryle, Wm., & Co.

Non-fluid Oils.
N. Y. & N. J. Lubricant Co.

Oil Cups.
Lunkenheimer Co.

Oil Engines.
——See Engines.

Oil-less Bearings.
Graphite Lubricating Co.

Oils.
Borne, Scrymser Co.
Harding & Fancourt, Inc.
N. Y. & N. J. Lubricant Co.

Oil Stencil and Press Board Paper.
Bradley, A. J.

Oiling Systems.
Lunkenheimer Co.

Overseaming Machines.
Merrow Machine Co.
Spindler, E. O.

Packing (Asbestos).
Johns-Manville Co., H. W.

Packings (Leather).
Graton & Knight Mfg. Co.

Packings (Metallic).
Johns-Manville Co., H. W.

Packing (Rubber).
Johns-Manville Co., H. W.

Paints.
Johns-Manville Co., H. W.
U. S. Gutta Percha Paint Co.

Pantagraphs for Mill Engraving.
Johnson, C. A., & Co.

Paper.
Merwin Paper Co.
Richardson Bros.

Paper Boards.
Merwin Paper Co.

Paper Bobbins and Spools.
American Paper Bobbin Co., Inc.

Alphabetical Index to Advertisers, with page numbers, follows this list.

Paper Cones and Tubes.
American Paper Bobbin Co., Inc.
Fairpoint Corporation.

Pastes (Specialty).
Pohl Machine Co.

Patent and Trade Mark Solicitors.
Crosby & Gregory.
Heard, Smith & Tennant.

Penstocks.
Hunt, Rodney, Machine Co.
Stearns Lumber Co., A. T.

Perforated Metal.
Allis-Chalmers Mfg. Co.
Beckley Perforating Co.

Peroxide of Hydrogen.
Roessler & Hasslacher Chemical Co.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co.

Picker Pins.
Dodge, C. S.

Pickers, Leather.
Garland Mfg. Co.
Graton & Knight Mfg. Co.

Picker Teeth.
Dodge, C. S.

Pluking Machines.
Oswego Machine Works.

Pipes and Fittings.
Parks, G .M., Co.
Scaife, W. B., & Sons.

Plush Machinery.
Buhlmann, A. W.
Parks & Woolson Machine Co.

Pneumatic Conveying.
——See Ventilating.

Portable Elevators.
Economy Engineering Co.
N. Y. Revolving Portable Elevator Co.

Power Plant Ventilating System.
Myrick, J. W. H.

Power Transmission Machinery.
Allis-Chalmers Mfg. Co.
American Pulley Co.
Cresson-Morris Co.
Evans, G. Frank.
Fairbairn, Lawson, Combe, Barbour, Ltd.
Fraser, Douglas & Sons, Ltd.
Graphite Lubricating Co.
Hunt, Rodney,, Machine Co.
Hunter, James, Machine Co.
Leffel, James, & Co.
Morse Chain Co. (Silent Chain).
Perkins, B. F., & Son, Inc.
Reeves Pulley Co.
Royersford Foundry & Machine Co.
Schofield, William, & Co.
Sellers, William, & Co.
S. K. F. Ball Bearing Co.
Textile Finishing Machinery Co.
Tolhurst Machine Works.

Preparatory Machinery (Cotton).
Firth, William, Co.
H. & B. American Machine Co.
Leigh & Butler.
Riley, C. E., Company.
Saco-Lowell Shops.

Preparatory Machinery (Wool and Worsted).
Smith & Furbush Mch. Co.

Presses.
American Laundry Machinery Co.
Boomer & Boschert Press Co.
Butterworth, H. W., & Sons Co.
Consolidated Hospital Sup. & Laundry Machinery Co.
Curtis & Marble Machine Co.
Phila. Drying Machinery Co.
Reliance Machine Works.
Saco-Lowell Shops.
Spence & Rideout.
Textile-Finishing Machinery Co.
U. S. Hoffman Co.
Woonsocket Mch. & Press Co.
Worthington, Henry R.

Presses (Drill and Punch).
Royersford Foundry & Machine Co. (also Trimming Presses).

Press Boards.
Case Bros., Inc.
Diamond State Fibre Co.

Press Papers.
Merwin Paper Co.
Philadelphia Drying Mchy. Co.
Richardson Brothers (Importers and Dealers).

Pulley Covering.
Graton & Knight Mfg. Co.

Pulleys.
——See Power Transmission Machinery.

Pumps.
Allis-Chalmers Mfg. Co.
Blake-Knowles Steam Pump Works.
Deane Steam Pump Plant.
Buffalo Steam Pump Co.
Gould's Mfg. Co.
Hunt, Rodney, Machine Co.
International Steam Pump Co.
Philadelphia Drying Machinery Co.
Textile-Finishing Machinery Co.
Worthington, Henry R.

Punches and Dies.
Royersford Foundry & Machine Co.

Purifying and Filtration Plants.
American Water Softener Co.
Hungerford & Terry.
Norwood Engineering Co.
Permutit Co.
Scaife, Wm. B., & Sons.

Quillers.
Foster Machine Co.
Payne, G. W., & Co.
Universal Winding Co.

Rag Pickers.
Dodge, C. S.
Schofield, Wm., Co.
Smith & Furbush Machine Co.
Tatham, William, Ltd.

Raw Hide Gears.
New Process Gear Corporation.

Reed and Harness Manufacturers.
American Supply Co.

Reed Making and Brushing Machines.
Lavigne & Suter.

Reed Wire.
Lavigne & Suter.

Revolving Portable Elevators.
N. Y. Revolving Portable Elevator Co.

Ribbons.
Cheney Bros.
Macungie Silk Co.

Rodent Exterminator.
Virus Ltd., Inc.

Roller Bearings.
Royersford Foundry & Machine Co. (also Babbitted Ring Oiling).

Roller Covers.
Graton & Knight Mfg. Co.

Roofing.
Barrett Mfg. Co.
Johns-Manville Co., H. W.

Rope Transmission.
Cresson-Morris Co.
Hunter, James, Machine Co.
Lambeth Rope Corporation.

Roving Cans.
American Vulcanized Fibre Co.
Diamond State Fibre Co.
Hill, James, Mfg. Co.
Standard Fibre Co.

Roving Reels.
Scott, H. L., & Co.

Rub Aprons.
Graton & Knight Mfg. Co.

Safety Set Screws.
Allen Manufacturing Co.

Sample Cutters.
Oswego Machine Works.

Sanitary Fountains.
Johns-Manville Co., H. W.
Puro Sanitary Drinking Fountain Co.
Rundle-Spence Mfg. Co.

Scales (Automatic).
American Kron Scale Co.

Scales.
National Scale Co.
Torsion Balance Co.

Scallop Machines.
Merrow Machine Co.

Schappe (French Spun).
Suter, Alfred.

Schools.
Bradford Durfee Textile Scool.
International Correspondence Schools.
Lowell Textile School.
New Bedford Textile School.
Philadelphia Textile School.

Scouring Machines.
——See Wool Washing, Preparing and Drying Machinery.

Second-hand Machinery.
——See Mchy. Dealers, also Classified Ads.

Securities.
Lachenbruch, Morton & Co.

Selling Agent.
Shirley, Harold R.

Separators (Yarn).
Draper Co., The.
H. & B. American Machine Co.

Sewing Machines and Supplies.
Birch Albert, Somerville Mach. Wks.
Birch Bros., Somerville Mach. Wks
Curtis & Marble Machine Co.
Dinsmore Mfg. Co.
Fales, L. F.
Somerville Machine Works (Albert Birch, prop.).
Spindler, E. O.
Textile Finishing Machinery Co.
Union Special Machine Co.
Willcox & Gibbs.

Shafting Hangers, Etc.
——See Power Transmission Machinery.

Shafting Rings (Leather).
Graton & Knight Mfg. Co.

Shearing Machinery.
——See Dyeing, Drying, Bleaching and Finishing.

Sheet Metal Works.
Scaife, W. B., & Sons.

Shoddy Pickers.
Curtis & Marble Machine Co.
Dodge, C. S.
Smith & Furbush Machine Co.

Shoes.
——See Dyers' Clogs.

Shuttles.
——See Bobbins, Spools, Shuttles, Etc.

Silk Dryers.
——See Drying Machinery.

Silk Machinery.
Atkinson, Haserick & Co.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Crompton & Knowles Loom Works.
Leigh & Butler.
Mason Machine Works.
Schwartz, L. H. A., & Co.
Suter, Alfred.
Textile-Finishing Machinery Co.

Silk Mill Supplies.
Hall, I. A., & Co.

Silk Noils.
Fawcett, Hughes.

Silk Paste.
Pohl Machine Co.

Silks (Raw).
Heineman, Oscar, Co.
Villa, A. P., & Bros.

Silk Throwsters.
Heineman, Oscar, Co.
Villa, A. P., & Bros.

Singe Plates.
Butterworth, H. W., Sons Co.
Taunton-New Bedford Copper Co.
Textile-Finishing Machinery Co.

Singeing Machines.
Birch Bros., Somerville Mach. Wks.
Butterworth, H. W., Sons Co.
Curtis & Marble Machine Co.
Leigh & Butler.
Philadelphia Drying Machinery Co.
Smith, Drum & Co.
Textile-Finishing Machinery Co.

Sizing, Starch and Gums.
American Diamalt Co.
Corn Products Refining Co.
Malt-Diastase Co.
Seydel Mfg. Co., The.
Sizing Specialties Co.

Alphabetical Index to Advertisers, with page numbers, follows this list.

Stein, Hirsh & Co.
Wolf, Jacques & Co.
Worden Chemical Works.

Skein Mercerizing Machines.
Buhlmann, A. W.

Skylights.
Van Noorden, E., & Co.

Slashers.
Leigh & Butler.
Riley, C. E., Company.
Saco-Lowell Shops.
Textile-Finishing Machinery Co.

Soaps.
Dobbins Soap Mfg. Co.
Draper, J. O., Co.
Seydel Mfg. Co., The.
Wrisley, Allen B., Co.

Soaping Machines.
Hunt, Rodney, Machine Co.

Softeners.
——See Cotton Softeners.

Spindles.
Atkinson, Haserick & Co.
Bamford & Smith.
Bodden, Wm., & Son, Ltd.
Buckley's, Benjamin, Sons.
Draper Company.
H. & B. American Machine Co.
Leigh & Butler.
Riley, C. E., Company.

Spindle Tubes.
Atkinson, Haserick & Co.
Bamford & Smith.
Firth, William, Co.
Riley, C. E., Company.

Spinning Frames.
Fairbairn, Lawson, Combe, Barbour, Ltd.

Spinning Frame Saddles.
Dixon Lubricating Saddle Co.

Spinning Rings.
Draper Company.
H. & B. American Machine Co.
Whitinsville Spinning Ring Co.

Spinning Tubes.
Buckley's, Benjamin, Sons.

Spools.
——See Bobbins, Spools, Shuttles, Etc., also Paper Bobbins and Spools.

Spoolers.
Allen, A. W.
Draper Company.
Lindsay, Hyde & Co.
Payne, George W., & Co.
Saco-Lowell Shops.
Smith & Furbush Machine Co.
Spindler, E. O.

Spot and Stain Removing Machine.
Sanitex Co., The.

Sprockets, Silent Chain.
Morse Chain Co.

Stacks.
Scaife, W. B., & Sons.

Stain Remover.
Oilsgo Co.

Steam Boilers.
Scaife, W. B., & Sons.

Steam Engines.
——See Engines.

Steam Jacket Kettles.
Badger, E. B., & Sons Co.
Butterworth, H. W., & Sons Co.
Textile-Finishing Machinery Co.

Steam Pumps.
Blake & Knowles Steam Pump Works.
Buffalo Steam Pump Co.
Deane Steam Pump Plant.
Goulds Manufacturing Co., The.
International Steam Pump Co.
Worthington, Henry R.

Steam Specialties.
Butterworth, H. W., & Sons Co.
Lunkenheimer Co., The.
Powell, Wm., Co.
Sargent's Sons, C. G., Corp.
Sturtevant, B. F., Co.
Textile-Finishing Machinery Co.

Steam Traps.
Sturtevant, B. F., Co.

Steam Turbines.
Allis-Chalmers Mfg. Co.
Buffalo Forge Co.
Buffalo Steam Pump Co.
General Electric Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Stencil Machines.
Bradley, A. J.

Stock Dryers.
——See Drying Machinery.

Stocking Dryers.
——See Drying Machinery.

Stokers.
Green Engineering Co.
Sturtevant, B. F., Co.

Stop Motion for Knitting Machines.
Boss Knitting Machine Works.
Crawford Manufacturing Co.

Stop Motion for Looms.
——See Warp Stop Motions.

Strappings (Leather).
Graton & Knight Mfg. Co.

Superheaters, Foster.
Power Specialty Co.

Tanks, Tubs and Vats.
Chicago Bridge & Iron Works
Hall, Amos H., Son & Co.
Klauder-Weldon Dyeing Mach. Co.
New England Tank & Tower Co.
Textile-Finishing Machinery Co.
Tolhurst Machine Works.
Scaife, W. B., & Sons.
Stearns, A. T., Lumber Co.
Woolford, G., Tank Mfg. Co.

Tapes, Braids and Edgings.
Barton, F. C.
Bias Narrow Fabric Co.
Friedberger-Aaron Mfg. Co.
Industrial Tape Mills Co.
Jenkins, E. Wheeler.
Krout & Fite Mfg. Co.
Lambeth Rope Corporation.
Macungie Silk Co.
Maurer, F. W., & Sons Co.
Weimar Bros.

Teasels.
Suter, Alfred.

Telephones (Interior Systems).
Pettes & Randall Co.

Temples.
Draper Co.

Testing Apparatus.
Perkins, B. F., & Son, Inc.
Scott, H. L., & Co.
Torsion Balance Co.

Textile Chemists.
Little, A. D., Inc.

Textile Engineers.
Buhlmann, A. W.
Myrick, J. W. H.
Suter, Alfred.
——See also Architects and Mill Engineers.

Textile Schools.
——See Schools.

Thread Guides.
Palmer, I. E., Co.

Time Detectors.
Pettes & Randall.

Time Recorders.
International Time Recording Co.
Pettes & Randall.

Tiering Machines.
Economy Engineering Co.
N. Y. Revolving Portable Elevator Co.

Tinsel Machinery.
Eppler, John, Machine Works.

Tools for Turning Calender Rolls.
Dickinson, Thomas L.

Top Cutting Machines.
Wildman Mfg. Co.

Trade Mark Law.
Crosby & Gregory.
Heard, Smith & Tennant.

Trade Mark Stamps.
Kaumagraph Company.

Trademarking Machinery.
Parks & Woolson Machine Co.

Trucks.
Bailey, Frank.
Diamond State Fibre Co.
Lane & Bro., W. T.
National Scale Co.
Standard Fibre Co.

Trucks, Motor.
Kissel Motor Car Co.
Pierce Arrow Motor Car Co.

Tubes.
American Paper Bobbin Co., Inc.
Fairpoint Corporation.
Standard Fibre Co.

Tubs.
——See Tanks, Tubs and Vats.

Turbines.
——See Water Wheels and Steam Turbines.

Twine.
Moore, C., & Co.
Richardson Bros.

Twist Counters.
Scott, H. L., & Co.
Suter, Alfred.

Twisting Machinery.
Saco-Lowell Shops.
Smith & Furbush Machine Co.

Underwear Press.
U. S. Hoffman Co.

Vacuum Extracting Machines.
Buhlmann, A. W.

Valves.
Lunkenheimer Co.
Powell, Wm., Co.

Valves (Rubber).
Johns-Manville Co., H. W.

Variable Speed Transmission.
Hunter, James, Machine Co.
Reeves Pulley Co.

Vats.
——See Tanks, Tubs and Vats.

Velvet Machinery.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Parks & Woolson Machine Co.
Schwartz, L. H. A., & Co.
Textile Finishing Machinery Co.

Ventilating Apparatus.
American Moistening Co.
Autoforce Ventilating System.
Berry, A. Hun.
Buffalo Forge Co.
Buffalo Steam Pump Co.
Carrier Engineering Corporation.
Crocker-Wheeler Co.
General Electric Co.
Parks, G. M., Co.
Perkins, B. F., & Son, Inc.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Sturtevant, B. F., Co.
Tolhurst Machine Works.

Ventilating Engineer.
Myrick, J. W. H.

Vulcanized Fibre.
American Vulcanized Fibre Co.
Diamond State Fibre Co.
Hill, James.
Standard Fibre Co.

Wadding Machinery.
Tatham, William, Ltd.

Warpers.
Crompton & Knowles Loom Works.
Draper Company.
Entwistle, T. C., Co. (Ball) (Beam).
Saco-Lowell Shops.
Smith & Furbush Machine Co.

Warping and Beaming Machinery.
Altemus, J. K.
Crompton & Knowles Loom Works.
Draper Company.
Entwistle, T. C., Co.
Lever, Oswald, Co.
Smith & Furbush Machine Co.
Suter, Alfred.

Warp Stop Motions.
Crompton & Knowles Loom Works.
Draper Company.

Warp Tying Machines.
Barber-Colman Co.

Washers (Cloth).
American Laundry Machinery Co.
Birch, Albert, Somerville Machine Works.
Birch Bros., Somerville Mach. Wks.
Butterworth, H. W., & Sons Co.
Hunt, Rodney, Machine Co.
Hunter, James, Machine Co.
Kenyon, D. R., & Son.
Philadelphia Drying Machinery Co.

Alphabetical Index to Advertisers, with page numbers, follows this list.

Somerville Machine Works (Albert Birch, prop.).
Textile-Finishing Machinery Co.

Washers (Leather).
Graton & Knight Mfg. Co.

Washing Soda.
Ford, J. B., Co.
Jordan, Jr., W. H. & F.

Waste Reclaiming Machinery.
Saco-Lowell Shops.
Smith & Furbush Machine Co.
Tatham, William, Ltd.

Waste Washing Machines.
Tatham, William, Ltd.

Watchman's Clocks.
Pettes & Randall Co.

Water Chemists.
American Water Softener Co.
Hungerford & Terry.
Permutit Co.
Scaife, W. B., & Sons Co.

Waterproofing Materials.
Barrett Mfg. Co.
Johns-Manville Co., H. W.

Water Purifiers and Filters.
American Water Softener Co.
Hungerford & Terry.
International Filter Co.
Permutit Co.
Scaife, W. B., & Sons Co.

Water Softeners.
American Water Softener Co.
Ford, J. B., Co.
Hungerford & Terry.
International Filter Co.
Norwood Engineering Co.
Permutit Co.
Scaife, W. B., & Sons Co.

Water Towers.
New England Tank & Tower Co.

Water Wheel Governors.
Hunt, Rodney, Machine Co.

Water Wheels.
Allis-Chalmers.
Hunt, Rodney, Machine Co.
Leffel, James & Co.

Weighing Apparatus.
American Kron Scale Co.

Winders (Cotton, Woolen and Worsted).
Allen, A. W.
Altemus, J. K.
Buhlmann, A. W.
Crompton & Knowles Loom Works.
Firsching, J. A.
Foster Machine Co.
Ireland Machine & Foundry Co.
Leigh & Butler.
Lever, Oswald Co.
Lindsay, Hyde & Co.
Payne, Geo. W., & Co.
Saco-Lowell Shops.
Smith & Furbush Machine Co.
Universal Winding Co.

Winders (Back).
Allen, A. W.

Winders (Hosiery).
Allen, A. W.
Altemus, Jacob K.
Foster Machine Co.
Leighton Machine Co.
Lever, Oswald, Co., Inc.
Payne, G. W., & Co.
Saco-Lowell Shops.
Spindler, E. O.
Universal Winding Co.

Wire Specialties.
Connecticut Mill Supply Co.

Wool.
Atkinson, Haserick & Co.

Wool Bagging Machines.
Dodge, C. S.

Wool Cleaning Compound.
Ford, J. B., Co.

Wool Combing Machinery.
Atkinson, Haserick & Co.
Crompton & Knowles Loom Works.
Leigh & Butler.
Riley, C. E., Company.

Wool Dryers.
——See Drying Machinery.

Wool and Waste Dusters.
Dodge, C. S.
Leigh & Butler.
Sargent's, C. G., Sons.
Schofield, Wm., Co.
Smith & Furbush Machine Co.

Woolen and Worsted Machinery.
Altemus, Jacob K.
Atkinson, Haserick & Co.
Birch, Albert, Somerville Machine Works.
Birch Bros., Somerville Mach. Wks.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Crompton & Knowles Loom Works.
Curtis & Marble Machine Co.
Fales, L. F.
Hood, R. H., Co.
Hunt, Rodney, Machine Co.
Hunter, Jas., Machine Co.
Kenyon, D. R., & Son.
Klauder-Weldon Dyeing Mach. Co.
Leigh & Butler.
Parks & Woolson Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Riley, C. E., Company.
Saco-Lowell Shops.
Sargent's, C. G., Sons.
Schofield, Wm., Co.
Schwartz, L. H. A., & Co.
Smith & Furbush Machine Co.
Somerville Machine Works (Albert Birch, prop.).
Textile-Finishing Machinery Co.
Woonsocket Mch. & Press Co.

Wool Oils.
Borne, Scrymser Co.
Seydel Mfg. Co.

Wool Washing, Preparing and Drying Machinery.
Atkinson, Haserick & Co.
Hunter, Jas., Machine Co.
Leigh & Butler.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Riley, C. E., Company.
Sargent's, C. G., Sons.
Schwartz, L. H. A., & Co.
Smith & Furbush Machine Co.
Speed & Stephenson.
Tolhurst Machine Works.

Yardnumbering Machinery.
Parks & Woolson Machine Co.

Yarn Conditioning Machines.
Sargent's, C. G., Sons.
Suter, Alfred.

Yarn Dryers.
——See Drying Machinery.

Yarn Testers.
Birch Bros., Somerville Mach. Wks.
Scott, H. L., & Co.
Suter, Alfred.
Torsion Balance Co., The.

YARNS, THREADS, ETC.

Carpet Yarns.
Lees, Jas., & Sons Co.

Cotton Yarns.
Florence Thread Co.
Jamieson, Jas. B.
Jenckes Spinning Co.
Jenkins, E. Wheeler.
Littauer, Ludwig.
Mindlin & Rosenman.
Mitchell, Jas. E., & Co.
Montgomery, J. R., Co.
Monument Mills.
Orswell Mills.
Porter, T. J., & Sons.
Sternberg, Fred, & Co.
Street, J. F., & Co.
Whitman, William, Co.

Flax, Hemp, Jute and Ramie.
Fawcett, Hughes.
Littauer, Ludwig.
Mindlin & Rosenman.
Porter, T. J., & Sons.
Ramie Agency.
Sternberg, Fred, & Co.

Gassed Yarns.
Florence Thread Co.
Jamieson, Jas. B.
Littauer, Ludwig.
Mindlin & Rosenman.
Sternberg, Fred, & Co.
Whitman, William, Co.

Glazed Yarns.
Florence Thread Co.
Jamieson, Jas. B.
Littauer, Ludwig.
Mindlin & Rosenman.
Orswell Mills.
Sternberg, Fred & Co.
Whitman, William Co.

Harness Twine.
Fawcette, Hughes.
Moore, C., & Co.
Sternberg, Fred, & Co.

Hosiery and Knitting Yarns.
Florence Thread Co.
Hyde, E. S.
Jenckes Spinning Co.
Littauer, Ludwig.
Mindlin & Rosenman.
Mitchell, Jas. E., & Co.
Monument Mills.
Porter, T. J., & Sons.
Sternberg, Fred, & Co.
Whitman, William, Co.

Linen Yarns.
Fawcett, Hughes.
Lindsay, Thompson & Co., Ltd.
Porter, T. J., & Sons.

Mercerized Yarns.
Aberfoyle Mfg. Co.
American Silk Spinning Co
Cascami Silk Spinning Co. of America.
Florence Thread Co.
Jamieson, Jas. B.
Littauer, Ludwig.
Mindlin & Rosenman.
Porter, T. J., & Sons.
Sternberg, Fred, & Co.
Whitman, William, Co.

Mohair Yarns.
Littauer, Ludwig.
Mindlin & Rosenman.
Montgomery, J. R., Co.
Whitman, William, Co.

Novelty Yarns, Tinsels, Silk Noils, Etc.
American Silk Spinning Co.
Cascami Silk Spinning Co. of America.
Jamieson, Jas. B.
Jenckes Spinning Co.
Littauer, Ludwig.
Mindlin & Rosenman.
Montgomery, J. R., Co.
Nonotuck Silk Co.
Sternberg, Fred, & Co.
Villa, Stearns & Co.

Silk Yarns.
American Silk Spinning Co.
Cascami Silk Spinning Co. of America.
Cheney Bros.
Nonotuck Silk Co.
Ryle, Wm., & Co.
Sauquoit Silk Mfg. Co.
Street, J. F., & Co.
Suter, Alfred.
Villa, Stearns & Co.

Silk Yarns (Artificial).
Littauer, Ludwig.
Mindlin & Rosenman.

Woolen and Merino Yarns.
Eaton Rapids Woolen Mills.
Hyde, E. S.
Jenckes Spinning Co.
Littauer, Ludwig.
Mindlin & Rosenman.
Shirley, Harold R.
Street, J. F., & Co.

Woolen Yarns.
Jamieson, Jas. B.
Lees, Jas., & Sons Co.
Littauer, Ludwig.
Mindlin & Rosenman.
Shirley, Harold R.

Worsed Yarns.
Lees, Jas., & Sons Co.
Littauer, Ludwig.
Mindlin & Rosenman.
Shirley, Harold R.
Whitman, William, Co.

Alphabetical Index to Advertisers, with page numbers, follows this list.

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Alphabetical Index to Advertisers

Aberfoyle Mfg. Co. 184b
Acme Ktg. Mch. & Needle Co. 232
Ainslie Knitting Machine Co. .. 236
Allen, A. W. 235
Allen Mfg. Co. 209
Allis-Chalmers Mfg. Co. 207
Altemus, Jacob K. ..... —
American Crayon Co. 175
American Diamalt Co. 214
American Dyewood Co. 179
American Laundry Machy. Co. .. 35
American Moistening Co. 41
American Paper Bobbin Co., Inc. 16b
American Pulley Co., The 35
American Silk Spinning Co. 198
American Supply Co. 191
American Vulcanized Fibre Co. 42
American Water Softener Co. .. 219
Ashworth Bros. 206
Atkinson, Haserick & Co. 208
Atteaux, F. E. & Co. 219
Autoforce Ventilating System .. 162

Badger, E. B., & Sons Co. 43
Badische Company 48
Bailey, Frank 213
Bamford & Smith 210
Barber-Colman Co. 190
Barrett Manufacturing Co. 204
Barton, F. C. 201
Bayer Co., The, Inc. 215
Beckley Perforating Co. 195
Berlin Aniline Works 214
Berry, A. Hun 43
Bias Narrow Fabric Co. 201
Birch, Albert 32
Birch Bros. 32
Bischoff, C., & Co. 215
Blake & Knowles Steam Pump Works ..... —
Bodden, Wm., & Son, Ltd. 40
Bond, Charles, Co. 195
Boomer & Boschert Press Co. .. 190
Borgner Cyrus, Co. 213
Borne, Scrymser Co. 40
Boss Knitting Machine Works .. 234
Bosson & Lane 216
Bradford Durfee Textile School 172
Bradley, A. J. 200
Breedon s Son, Wm. 239
Brinton, H., & Co. 229
Broadbent, Thomas, & Sons 145
Brophy's Sons, T. 212
Brown's, Wm., Sons 212
Buckley's, Benj., Son 208
Buffalo Forge Co. 34
Buffalo Steam Pump Co. ..... —
Buhlmann, A. W. 36
Bukey Service 163
Butterworth, H. W., & Sons Co. 1

Carrier Engineering Corporation 7
Cascami Silk Spinning Co. of America 198
Case Brothers 239
Cassella Color Co. 216
Chaffee Bros.' Company 210
Cheney Bros. 196
Chicago Bridge & Iron Works .. 182
Claes & Flentje 236
Connecticut Mill Supply Co. 206
Consolidated Hospital Supply & Laundry Machinery Co. 210
Continental Latch Needle Co. .. 156
Cooper, Charles 221
Cooper Hewitt Electric Co. ..... —
Corn Products Refining Co. 18
Cramer, Stuart W. 26
Crane Mfg. Co. 233
Crawford Manufacturing Co. 235
Cresson-Morris Co. 37
Crocker-Wheeler Co. 42
Crompton & Knowles Loom Works 16
Crosby & Gregory 162
Curtis & Marble Machine Co. .. 189

Davidson, John F. 212
Deane Steam Pump Plant ..... —
Decatur Foundry, Furnace & Machine Co. 175
Diamond State Fibre Co. 213
Dickinson, Thomas L. 208
Dinsmore Mfg. Co. 38
Dixon Lubricating Saddle Co. .. 206
Dobbins Soap Mfg. Co. 190
Dodge, C. S. 44
Domestic Machinery Works 239
Draper Company 2, 3
Draper, J. O., Co. 194
Dronsfield Bros., Ltd. 175
Durant Mfg. Co. 189
Dyer, W. E. S. 162

Eastman Machine Co. Outside Back Cover
Eaton Rapids Woolen Mills 195
Economy Engineering Co. 174
Electro Bleaching Gas Co. 215
Elliott & Hall 208
Entwistle Co., T. C. 44
Eppler, John, Machine Works .. 235
Eureka Fire Hose Mfg. Co. 236
Evans Friction Cone Co. 209
Excelsior Needle Co. 239

Fairbairn, Lawson, Combre, Barbour, Ltd. 32
Fales, L. F. 234
Farbwerke-Hoechst Co. 217
Fawcett, Hughes 188
Federation of Trade Press Associations 28
Ferguson, John W. 162
Firsching, Joseph A. 237
Florence Thread Co. 188
Ford, J. B., Co. 178
Foster Machine Co. 4
Franklin Process Co. 176
Fraser, Douglas & Sons, Ltd. .. 240
Friedberger-Aaron Mfg. Co. 228

Gandy Belting Co. 45
Garland Mfg. Co. 151
Geisenheimer & Co. 213
General Electric Co. ..... Inside Back Cover
Gerry, Geo. W., & Son ..... —
Giles Dyeing Mch. Co., John H. 39
Globe Dye Works Co. 212
Gormly, Robert W., & Co. 237
Goulds Mfg. Co. 31
Graphite Lubricating Co. 182
Graton & Knight Mfg. Co. 25
Green Engineering Company 45

Hall, Amos H., Son & Co. 218
Hall, I. A., & Co. 200
Halton's, Thomas, Sons 40
H. & B. American Machine Co. 50
Harding & Fancourt, Inc. 164
Heard-Smith & Tennant 162
Heathcote, John, & Son 45
Heineman, Oscar, Co. 201
Hemphill Mfg. Co. 225
Hepworth, John W., & Co. 230
Hill, James, Mfg. Co. 182
Hodgson, Walter W. 208
Home Bleach & Dye Works 212
Home Insurance Co. 203
Hood, R. H., Company 175
Hopkinson Dyeing & Textile Works 212
Hungerford & Terry 220
Hunt, Rodney, Machine Co. 26
Hunter, Jas., Machine Co. 14
Hussong Dyeing Machine Co. .. —
Hyde, Edward S. 194

India Alkali Works 208
Industrial Tape Mills Co. 188
Innis Speiden & Co. 215
International Cor. Schools 235
International Filter Co. 213
International Pulp Co. 206
International Steam Pump Co. 44

Ireland Machine & Foundry Co. 44
Ives, L. T., Co. 239

Jamieson, J. B. 194
Jenckes Knitting Mch. Co. 230
Jenckes Spinning Co. 188
Johns-Manville Co., H. W. 33
Johnson, Chas. A., & Co. 212
Jones & Hardy, Inc. 237
Jordan, W. H. & F., Jr. 219

Kalle Color & Chemical Co., Inc. 214
Kaumagraph Company 208
Kemp, C. M., Manufacturing Co. 31
Kenyon, D. R., & Son 159
Keystone Latch Needle Co. 239
Kissel Motor Car Co. 173
Klauder-Weldon Dyeing Mch. Co. 146
Klipstein, A., & Co. 213
Krout & Fite Co. 188
Kunze, Otto 187

Lachenbruch, Morton & Co. 205
Lamb Knitting Machine Co. 222
Lambeth Rope Corporation 187
Lane, W. T., & Bro. 22
Lees, James, & Sons Co. 194
Leffel, James, & Co. 46
Leigh & Butler 6
Leighton Machine Co. 231
Lever, Oswald Co., Inc. 30
Leyland, Thomas, & Co. 17
Lindsay, Hyde & Co. 187
Littauer, Ludwig 200
Little, Arthur D., Inc. 162
Lowell Crayon Co. 195
Lowell Textile School 37
Lunkenheimer Co. 151

Macungie Silk Co. 200
Main, Charles T. 163
Malt-Diastase Co. 218
Manufacturers Machine Co. —
Mason Brush Works —
Mason Machine Works 8
Maurer, F. W., & Sons Co. 188
Merrow Machine Co. 228
Merwin Paper Co. 186
Metallic Drawing Roll Co. 184
Mindlin & Rosenman 201
Mitchell Co., Jas. E. 187
Montgomery, J. R., Co. 186
Monument Mills 186
Moore, C., & Co. 187
Morse Chain Company 21
Morton & Andrews 172
Myrick, J. W. H. 162

National Aniline & Chemical Co. 217
National Laundry Mchy. Co. —
National Scale Co. 33
National Silk Dyeing Co. 196
New Bedford Textile School 199
New England Butt Co. 234
New Eng. Tank & Tower Co. 220
New Process Gear Corporation 23
New York Revolving Portable Elevator Co. 45

N. Y. & N. J. Lubricant Co. 207
Nonotuck Silk Co. 186
Norwood Engineering Co. 220
Nye & Tredick Company 233

Orswell Mills 188
Oswego Machine Works —
Otis Elevator Co. 13

Pairpoint Corporation, The 156
Palmer, I. E., Co. 46
Parks, G. M., Co. 10, 11
Parks & Woolson Machine Co. 176
Paxton & O'Neill 226
Payne, Geo. W., Co. 236
Pearson, Jos. T. 227
Peerless Company, The 212
Perkins, B. F., & Sons, Inc. 182
Permutit Co. 39
Pettes & Randall Co. 200
Pierce-Arrow Motor Car Co. 24
Philadelphia Drying Mchy. Co. 16a
Philadelphia Textile Mchy. Co. 240
Philadelphia Textile School 211
Porter, T. J., & Sons 188
Powell, Wm., Co. 42
Power Specialty Co. 210
Puro Sanitary Drinking Fountain Co. 177

Ramie Agency 188
Reeves Pulley Co. 38
Reliance Machine Works 36, 239
Richardson Bros. 214
Ridgway, Craig & Son Co. 180
Riera, Pedro Sobre —
Riley, C. E., Company 145
Roessler & Hasslacher Chemical Co. 180
Root, C. J., Co. 209
Royersford Fndry. & Mch. Co. 37
Rundle-Spence Mfg. Co. 39
Ryle, William, & Co. 198

Saco-Lowell Shops 5
Salem Elevator Works 41
Sanitex Co., The 195
Sargent's, C. G., Sons Co. 12
Sauquoit Silk Mfg. Co. 197
Scaife, W. B., & Sons Co. 213
Schaum & Uhlinger, Inc. 34
Schieren, Chas. A., Co. 19
Schofield, William, Co. 174
Schwartz, L. H. A., & Co. 27
Scott, Henry L., & Co. 170
Scott & Williams, Inc. 168
Sellers, Wm., & Co. 41
Seydel Manufacturing Co. Outside Back Cover
Shirley, Harold R. 194
Shoemaker, J. L., & Co. 237
Sizing Specialties Co., Inc. 200
S. K. F. Ball Bearing Co. 29
Smith, Drum & Co. 30
Smith & Furbush Mch. Co. 192
Snow Steam Pump Plant 44
Somerville Machine Works 32

Spence & Rideout 235
Spindler, E. O. 226
Stafford Co., The —
Stafford & Holt 229
Standard Fibre Co. 42
Standard Machine Co. 231, 237
Stearns, A. T., Lumber Co. 218
Steel Heddle Mfg. Co. 189
Stein, Hirsh & Co. 214
Stephenson Mfg. Co. 46
Sternberg, Fred, & Co. 187
Street, J. F., & Co. 187
Sturtevant, B. F., Co. 149
Suter, Alfred 184, 184a
Sykes, Walter F., & Co. 214

Tatham, William, Ltd. —
Taunton-New Bedford Copper Co. 212
Tebbets, E. L., Spool Co. 191
Textile-Finishing Machinery Co. Inside Front Cover
Textile Machine Works 232
Thayer, Edward M., & Co. 214
Thompson, Lindsay, & Co., Ltd. 188
Tolhurst Machine Works 43
Tompkins Bros. Co. 236
Torsion Balance Co. 176
Uniform Dyeing Machine Co. 38

Union Button Sewing Co. 234
Union Special Machine Co. 227
United States Conditioning & Testing Co. 200
U. S. Gutta Percha Paint Co. 9
U. S. Hoffman Co. 146
Universal Winding Co. Outside Back Cover
Utica Willowvale Bleaching Co. 202

Van Noorden, E., & Co. 210
Villa, A. P., & Bros. 199
Villa, Stearns Co. 197

Virus Limited, Inc. 191
Walther, Otto 224
Wardwell Needle Co. 239
Watson, Laidlaw & Co., Ltd. 20
Wayte, W. J., Inc. 20
Weimar Bros. 188
Weinerth Ktg. & Mch. Co., Inc. 235
Westinghouse El. & Mfg. Co. 15
Whitinsville Spinning Ring Co. 46
Whitman, William, Co. 194
Whiton, D. E., Machine Co. 210
Wildman Mfg. Co. 223
Willcox & Gibbs Sewing Machine Co. 232
Williams, I. B., & Sons —
Wing & Evans, Inc. 219
Wolf, Jacques & Co. 215
Woolford, G., Wood Tank Mfg. Co. 218
Woonsocket Mch. & Press Co. —
Worden Chemical Works 208
Worthington, Henry R. —
Wrisley, Allen B., Co. 211

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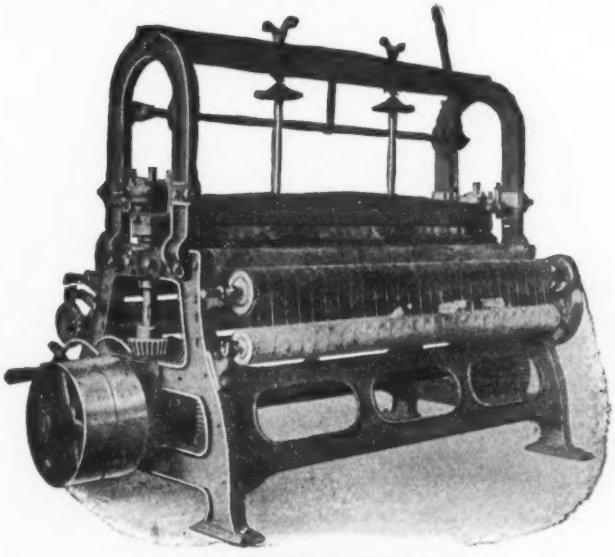

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It is, therefore, a clearing house of information for the man who wants equipment for a textile mill.

Nevertheless it may be that you want something not advertised in the Textile World Record.

If so you are at perfect liberty to consult us and it is more than likely that from our file of catalogs, and other sources of information, we can give you the desired facts.

Stop Losing Interest on Idle Capital

In textile mills throughout the country there are tens of thousands of dollars worth of discarded textile machines lying idle.

That is to say, machinery which, because of a change in the method of manufacture, character of product, or installation of newer equipment, has been discarded and is no longer of any practical use to its present owners.

This machinery, mill or power plant equipment may however, be just what some other mill, dye house, or bleachery is looking for.

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Its subscribers include textile mill men who spend about $250,000,000 a year for textile machinery, equipment and supplies—not including raw material.

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Of this edition over 6,100 copies are printed and all are needed.

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THE following list contains the titles of some of the textile books which we recommend. We carry these in stock for prompt delivery. Our full descriptive catalog, giving lists of practically all textile books published in the English language, with a brief synopsis of contents, will be mailed free.

General Subjects

Advanced Textile Design, *Watson*	$4 00
Analysis of Woven Fabrics, *Barker and Midgley*	3 00
Art of Soap Making, *Watt*	3 00
Calculations in Yarns and Fabrics, *Bradbury*	1 25
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Jacquard Weaving and Designing, *Bell*	4 00
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Faults in the Manufacture of Woolen Goods and their Prevention, *Reiser*	2 50
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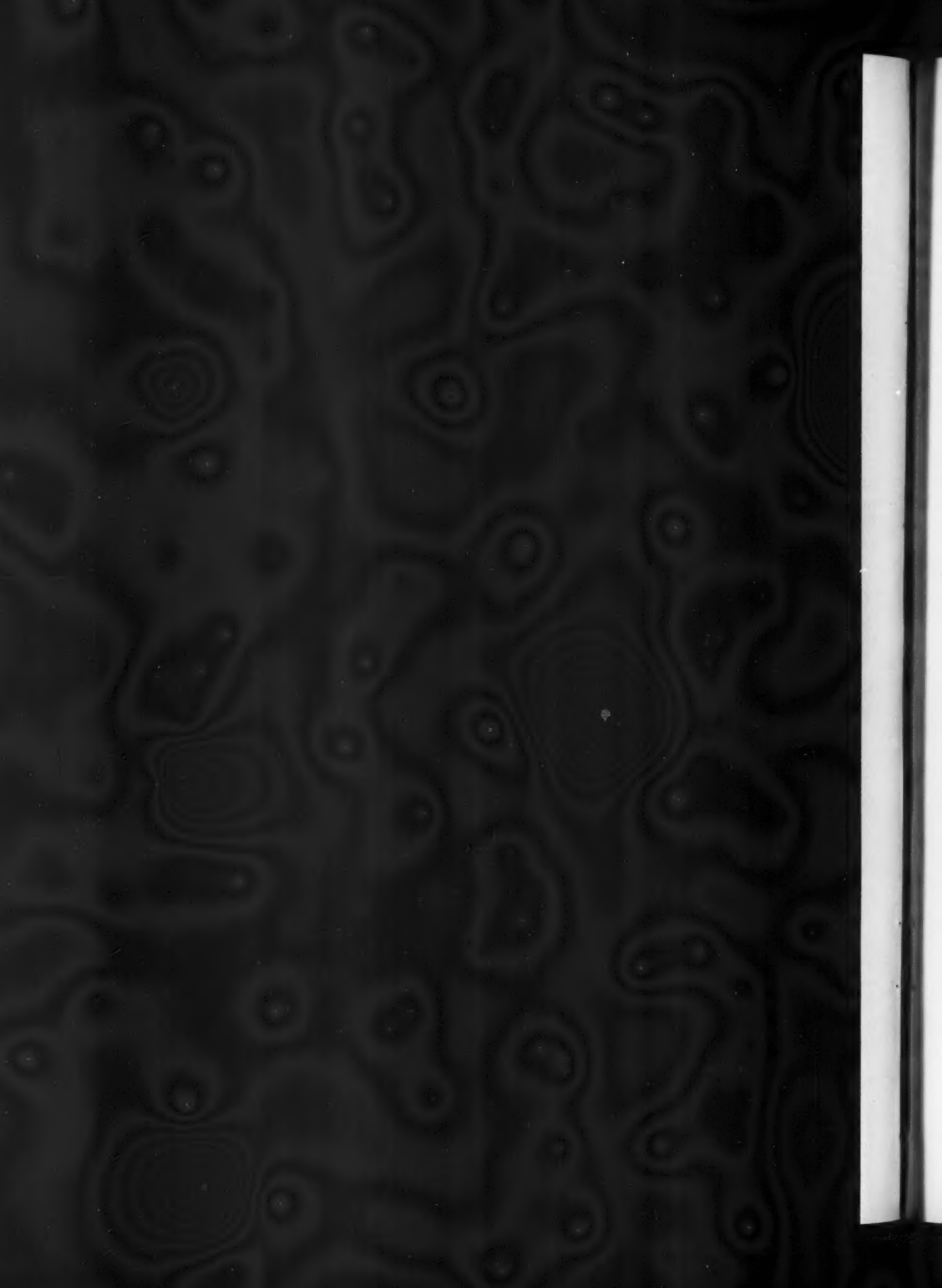

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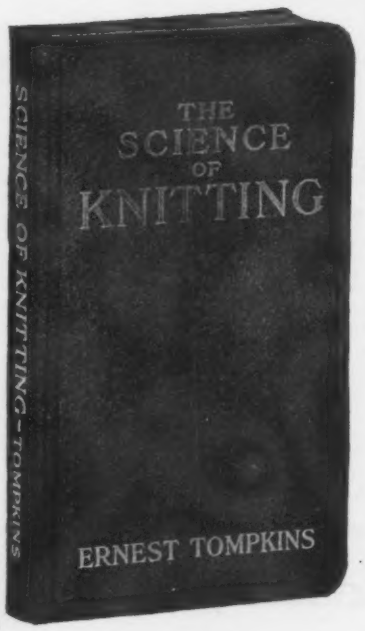

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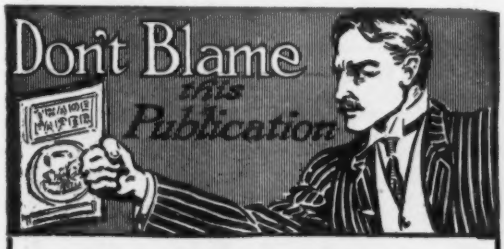

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Fixer on Circular Machines; has worked on underwear, sweaters, knit cloth, etc.; familiar with Leighton, Scott & Williams, Wildman, Stafford & Holt, Nye & Tredick and other machines; 25 years of age; married; good reference.
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Assistant Superintendent of Cotton Mill; would consider position as office manager, accountant, or to specialize on costs; has worked on all kinds of fine, plain and fancy cotton goods; 30 years of age; married; good reference.
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Receiving and Shipping Clerk; is familiar with woolens, worsteds and cotton worsteds; 29 years of age; married; will not go to Me., Pa., N. J., West, South or to Canada; good reference.
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Second Hand or Overseer of Carding in Woolen Mill; has worked on all kinds of goods from 1 to 8 run; familiar with Davis and Furber machines; 37 years of age; married; good reference.
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Assistant Designer; has worked on worsted dress goods; familiar with Platt Bros., Lowell, and Prince & Smith machines; 24 years of age; good reference; graduate of Textile School.
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Second Hand of Dyeing in Woolen Mill; would consider position as overseer of dyeing also; has worked on worsted yarn and pieces, raw stock, wool and cotton, men's and women's wear; 31 years of age; good reference; will not go South.
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Fixer in Knitting Mill; would consider position in charge of knitting; has worked on sweaters, bathing suits, jerseys and sweater coats; familiar with Dubied, Bach, Wildman, Leighton, Harrison, Seyfort, Donner, circular and other machines; 30 years of age; married; good reference.
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Director of Textile School, Commission House, or would consider position as assistant superintendent in mill; is interested in technical work of any kind; has worked on cotton, wool, worsted, silk, single and ply and a variety of fancies; familiar with Crompton, Knowles, Mason, Lowell, Whitin, Howard & Bullough, Saco and Pettee machines; 35 years of age; married; will go anywhere for a good position; good reference.
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Manager or Agent of Knitting Mill; has worked on a high class of men's, women's and children's s amless hosiery in silk, silk lisle, and lisle and cotton; familiar with Acme, Brinton, Banner & Jenckes machines; 34 years of age; married; good reference.
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Overseer of Knitting; has worked on high-grade goods, ladies', misses' and men's underwear; familiar with Scott & Williams, Wildman, Stafford & Holt, Nye & Tredick, Tompkins and Gormley machines; 45 years of age; married; good reference.
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Second Hand Finishing in Woolen Mill; has worked on fancy woolens and worsteds; will not go to Pa., N. J., West, South or Canada; 32 years of age; married; good reference.
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Superintendent of knitting mill; might consider position as boss finisher or boss knitter; has worked on men's and ladies' underwear, sweaters and toques; familiar with Scott & Williams, Wildman, Stafford & Holt, Tompkins, Lamb, Nye & Tredick and all makes of sewing machines; 47 years of age, married; will not go South; good reference.
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Foreman or cutter in knitting mill; has worked on merino and mercerized underwear; familiar with flat lock knitting machines; 24 years of age; good reference.
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Overseer of Carding, spinning or both in woolen mill; is familiar with all makes of machinery; 32 years of age, married; will not go South or to Canada; good reference.
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Overseer of circular spring needle knitting; has worked on cotton and woolen nets, fleece linings, etc.; familiar with all styles of goods made on these machines; also Tompkins, Campbell & Clute, American twist drill, Gormley and Wildman machines; 26 years of age; will not go South; good reference.
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Master Mechanic in cotton mill; is familiar with all kinds of cotton, silk, dyeing and thread machinery; 39 years of age, married; would like to locate in Rhode Island; good reference.
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Overseer of Weaving in cotton mill; has worked on plains, twills, sateens, heavy contils, fancies of all kinds, lenos, lappetts, seersucker cloth, pillow tubing, etc.; familiar with Lewiston, Mason, Crompton & Knowles, fancy, Draper, in fact all kinds of looms; 30 years of age, married; will not go West, South or to Canada; good reference.
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Overseer of Dyeing; has worked on worsted and woolen piece dyes, fancy goods, mackinaws cotton worsteds, shoddy and cotton mixes, cassimeres, coverts, etc.; familiar with Klauder-Weldon and Delahunty dyeing machines; 40 years of age, married; good reference.
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Overseer of Carding, second-hand or boss comber in cotton mill; has worked on all classes of fine combed goods; familiar with Whitin, Woonsocket, Saco, Lowell, and Pettee machines; 28 years of age; good reference.
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Second Hand in shoddy card room; has worked on all grades of shoddy; familiar with Lombard, James Smith and other cards; 28 years of age, married; good reference.
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Overseer of Finishing in woolen mill; has worked on all kinds of woolens and worsteds; familiar with all kinds of finishing machinery; 46 years of age, married; will not go South or to Canada; good reference.
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Boss Spinner in woolen mill; has worked on all classes of goods; familiar with Davis and Furber mules; 30 years of age, married; will not go to Pa., West, South or to Canada; good reference.
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Assistant Designer, assistant superintendent in woolen mill; has worked on broad cloths, woolens, worsteds, blankets, etc.; familiar with pickers, cards, looms and presses; will not go to Pa., N. Y., N. J., West, South or to Canada; 26 years of age; good reference.
6339, Textile World Record, Boston, Mass.

Overseer of Weaving in woolen mill; has worked on fancy dress goods and fancy worsteds; familiar with Knowles looms; 40 years of age, married; good reference.
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Assistant Superintendent in cotton mill; would take position doing efficiency work in mill; 25 years of age; will go anywhere for good position; good reference.
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Boss Dyer in woolen mill; has worked on woolens, worsteds and cotton mixed goods; 34 years of age, married; will not go to N. Y., N. J., West, South or Canada; good reference.
6386, Textile World Record, Boston, Mass.

Boss Weaver in cotton mill; has worked on plain, fancy and silk goods; duck cloth, leno work, in fact all makes of goods; familiar with Crompton & Knowles, Whitin, Colvin, Draper and jacquard looms; has a technical as well as practical knowledge; 35 years of age, married; will not go to Pa., West, South or Canada; good reference.
6387, Textile World Record, Boston, Mass.

Boss Carder in woolen mill; has worked on all kinds of goods from the cheapest to the best; familiar with Lombard, Cleveland, Davis & Furber, Furbush and English cards; 37 years of age, married; will not go to N. H.; good reference.
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6389, Textile World Record, Boston, Mass.

Boss Weaver in cotton mill; has worked on cotton blankets; familiar with Crompton & Knowles blanket looms; 38 years of age, married; will not go to Pa., N. J., or South; good reference.
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Overseer of Dressing, Winding or Spooling. Has worked on worsteds, cotton worsteds, woolens and silk; both wet and dry work; familiar with Davis & Furber and Cleveland machines; 45 years of age; married; good reference.
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Superintendent of Woolen Mill. Has worked on kerseys, broad cloths, meltons, cloakings, overcoatings, dress goods, cassimeres and novelties; familiar with about all makes of machinery; 50 years of age; married; will not go West, South or to Canada; good reference.
6411, Textile World Record, Boston, Mass.

Agent or Superintendent of Cotton Mill. Has worked on all classes of goods; 50 years of age; married; good reference.
6412, Textile World Record, Boston, Mass.

Boss Dyer in Woolen Mill. Has worked on all classes of woolen goods either in the piece, yarn or raw stock; will not go West, South or to Canada; 45 years of age; married; good reference.
6413, Textile World Record, Boston, Mass.

Overseer of Knitting. Has worked on silk, cotton, artificial silk, worsted, wool and wool mixtures; light to heavy weight hosiery; familiar with footers, ribbers, loopers; flat, sweater and button-hole machines; 30 years of age; married; prefers Wis., Mich., Ohio, Ind., Ill., Ia. or Minn.; good reference.
6414, Textile World Record, Boston, Mass.

Assistant Designer in Woolen Mill. Has worked on woolens and worsteds; familiar with Crompton and Knowles loms; 35 years of age; married; good reference.
6415, Textile World Record, Boston, Mass.

Overseer of Dyeing in Woolen Mill. Has worked on raw stock, worsted and cotton yarns, slubbing, piece dyes, men's wear and dress goods; 42 years of age; married; good reference.
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Designer and Superintendent of Woolen Mill. Would take position of manager in small mill; conversant with all makes and classes of tweeds in highest, medium and lowest class of stocks; worked during past sixteen years on suitings, overcoatings, cloakings, plaid rugs, worsted suitings, coverts, meltons, trouserings and all military goods; experience in Scotch, English and American trades; familiar with practically all English and American woolen machinery; 36 years of age; married; will not go South or to Canada; good reference.
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Overseer of Dyeing in Cotton Mill. Has worked on denims, tickings, ginghams, coverts, etc.; familiar with long and short chain warp machines, Klauder-Weldon, Delahunty rotary Delahunty and Chattanooga vacuum on cotton; 49 years of age; married; good reference.
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Boss Weaver in Cotton Mill. Has worked on medium and heavy sheetings, drills, twills, crashes, sateens, light and heavy weaves, chambrays, ginghams, light and extra heavy duck goods, bags, etc.; familiar with Stafford, Draper, Lowell, Crompton, Knowles and Whitin looms; 34 years of age; married; good reference.
6419, Textile World Record, Boston, Mass.

Overseer of Carding in woolen mill. Has worked on all kinds of goods; familiar with Davis & Furber and Lombard machines; 45 years of age; married; will not go to Me., Pa., N. Y., N. J., West, South or Canada; good reference.
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Second Hand in Finishing Room in Woolen Mill. Has worked on all classes of woolens, fancy dress-goods and suitings; familiar with all makes of machinery; 26 years of age; married; will not go to Vt. Pa., West, South or Canada; good reference.
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Overseer of Dyeing in Woolen Mill. Has worked on raw stock, yarn and pieces; familiar with all makes of machinery; 41 years of age; married; good reference.
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Overseer of Burling and Mending in Woolen Mill. Would consider position as second hand of dry finishing. Has worked on all classes of woolens, worsteds, cotton worsteds and dress goods; 29 years of age; married; will not go to Vt., N. Y., N. J., West, South or Canada; good reference.
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Woolen Superintendent or Designer. Would consider position as boss weaver also; has worked on worsted and woolen men's suitings, overcoatings, plain and plaid backs, piece dyes, coverts, cloakings and dress goods; familiar with Crompton & Knowles looms; Davis and Furber cards and mules; 30 years of age; married; will not go West or South; good reference.
6424, Textile World Record, Boston, Mass.

Overseer of Weaving in Cotton Mill. Has worked on all classes of white cotton; familiar with all kinds of American looms; 35 years of age; married; good reference.
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Overseer of Weaving in Cotton Mill. Would consider good position as second hand; has worked on ducks, sheetings, drills, twills, sateens and all heavy white goods; familiar with Draper, Lowell and Stafford looms; 28 years of age; married; good reference.
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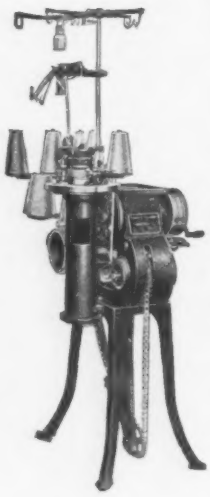

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By installing our Model G machines you can make all sizes of men's, women's, children's and infants' stockings upon the same machine and without the use of ribbers.

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New York **88 Pearl Street, Boston** Utica

Canada, Ontario, Hamilton. It is reported that T. Eaton Co., Ltd., manufacturers of knitted ties, sweater goods and underwear at 190 Yonge St., Toronto, and also the largest retailers in Canada, employing about 18,000 people, will erect a large new mill at Hamilton to be in charge of Arthur E. Thomas, Dept. E-12.

*Canada, Ontario, Kincardine. William Mitchell is ready to make arrangements for machinery for his new hosiery mill. The tax payers voted last March to appropriate a sufficient amount of money for a location of a plant here. A building is under construction in which machinery will be installed to make lisle, cotton, silk and cashmere hosiery for men, women and children.

*Florida, Ocala. The Ocala Knitting & Mfg. Company has been incorporated with capital stock of $50,000, by Geo. Giles, president; F. P. Gadsden, vice-president; and J. L. Wiley, treasurer. In April it was noted that Mr. Giles would establish a knitting mill here in a building 100 by 50 feet.

*Florida, Ocala. Manufacturing has been started by the new Ocala Knitting & Mfg. Company in temporary quarters, but the construction of a two story brick building, 50 by 100 feet, will be started at once. As noted previously this company was recently incorporated with capital stock of $50,000. George Giles is president; J. S. LaRoche, treasurer; H. F. Booth, superintendent and buyer. Men's, women's and children's knitted underwear are being manufactured. Electric power is used.

*Georgia, Athens. Manufacturing will be started about September 15 by the new Holland Mfg. Company, recently organized with capital stock of $100,000 to manufacture men's and women's hosiery. A building has been leased on Broad St., and manufacturing will be started with 25 knitting machines and 2 sewing machines, which have been ordered. About 25 hands will be employed. W. C. Wilson is president; S. C. Candler, treasurer and buyer; and T. W. Woodham, superintendent. The product will be sold direct for the present. They have a dyehouse and steam and water power.

*Georgia, Valdosta. R. B. Oliver and Knox Burger of the Maryville (Tenn.) Hosiery Mills, were here recently going over with local investors plans for a new hosiery mill. It has been noted previously that a company would be organized with capital stock of $50,000 and that a 100-machine knitting mill with dyeing and finishing facilities would be built and equipped.

Massachusetts, Stoughton. Maurice A. Goldman, of Mackintire, Lawrie & Co., 282 Devonshire St., Boston, has purchased the machinery formerly owned and operated by the Laconia Knitting Co., at Laconia, N. H., and will move it to a building here and manufacture knitted men's wear. The machinery is now being shipped and will be in operation within a few days. A name for the plant has not been selected as yet.

*New Jersey, Trenton. Contract for the new branch plant of William F. Taubel, Inc., of Riverside, has been awarded to Harrison C. Rea Company. The building will be 3 stories of concrete and brick construction, 50 by 150 feet.

New York, New York City. The Emerald Hosiery Mills, Inc., is the name of a new mill established at 4285 Park Ave., with capital stock of $80,000, to manufacture full fashioned cotton, lisle, and silk hosiery. Thomas O'Callaghan is president; Henry W. Fedden, treasurer, and George Fedden, secretary and buyer. They are all connected with the firm of O'Callaghan & Fedden, 121 E. 24th St., selling agents, which will sell the product. Electric power will be used.

*New York, Palatine Bridge. Henry Underwood, recently reported as establishing a silk underwear fabric mill here, has leased a building and some machinery has been received. It is expected that operations will start within a week. He has an option on some other property here and expects to purchase it and enlarge the business later.

*New York, Stapleton. The Stapleton Knitting Mills have been organized and a plant at 677 Bay St. has been leased by J. Berman. Eight knitting machines and six sewing machines are being operated on men's, women's and children's sweaters. In recent reports the name of this mill has been given as the Berman Knitting Mills.

North Carolina, Dunn. T. V. Smith, cashier of the local bank, may install hosiery knitting equipment in a building here. He is interested in particulars of equipment.

*North Carolina, Forest City. W. R. Leister, who it was reported would establish a knitting mill at Forest City, will begin manufacturing with 12 knitting machines. This equipment has not been purchased. Mr. Leister's address is 500 Whaley St., Columbia, S. C.

*North Carolina, Haw River. W. H. Childrey, previously reported establishing a new hosiery mill here, will manufacture under the name of the Childrey Hosiery Mills, making men's fine gauge mercerized and silk hosiery on 20 knitters, 4 ribbers and 3 loopers. This equipment is all new. It is expected that after the plant is running smoothly more machinery will be added. Manufacturing will be started about July 15, giving employment to 15 hands. Electric power will be used. The product will be sold direct. Mr. Childrey was formerly secretary, treasurer and general manager of the Regina Hosiery Mfg. Company, but has resigned this connection to start up the new plant.

North Carolina, Icard. The Icard Mfg. Company, whose organization was noted in January, has established a new knitting mill here to manufacture 176-needle cotton hosiery. The building is already finished and is now ready for machinery which is being installed. D. B. Mull and W. Y. Frazier are the buyers and will have the management of the mill. They are both connected with the Connellys Springs Knitting Mill Company of Connellys Springs, N. C. It was reported previously that these men had established a lumber and roller mill here and that a knitting mill would be built in the future, and that a cotton mill might be built in a few years. The new knitting mill will start operations August 1.

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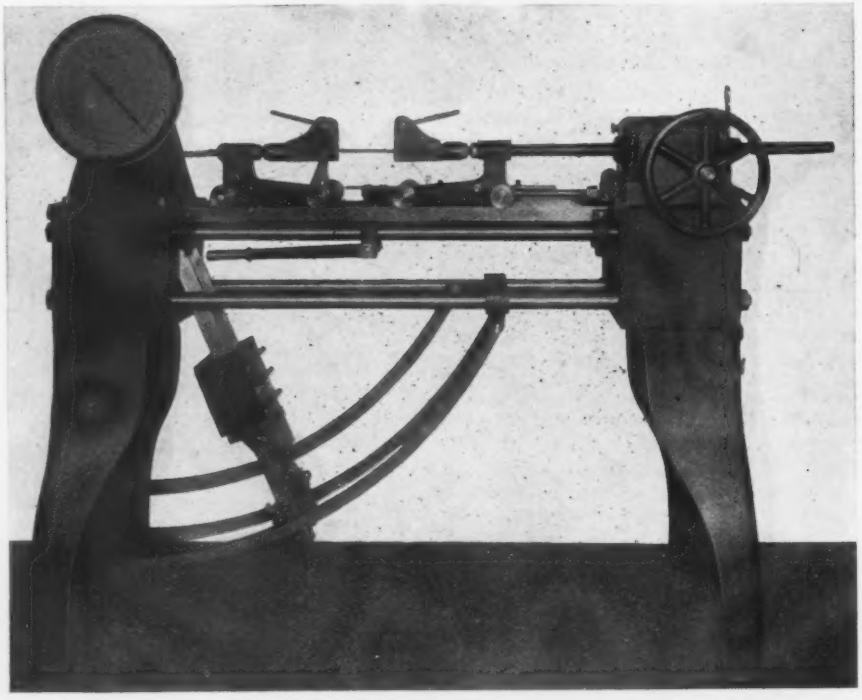

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On some tests recently made on our Scott machine and several other standard heavy testing machines the deviation from the mean on our results was 2% while on the other machines it varied between 8% and 14%.

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*Pennsylvania, McAdoo. It is expected the new McAdoo Knitting Mill will begin manufacturing about October 1 with 10 knitting machines and 8 sewing machines on women's and children's underwear. W. F. Miller will be president and buyer, and W. Russell Miller will be superintendent.

Pennsylvania, Middletown. J. B. Farthing and C. A. Ruth have leased space for the manufacture of hosiery here.

Pennsylvania, Philadelphia. An application for a charter has been made by Henry Brown, Mrs. Elizabeth Brown, William Brown, John H. Brown and Victor W. Mills for a corporation to be known as Henry Brown & Sons Co. This concern, as per a recent report made by us, will commence its operations in the Model Mills, Ontario and I Sts., where they will install full fashioned machinery for making a line of cotton, mercerized and silk hosiery, the equipment of the plant having already been ordered and a portion of which is now being delivered and installed.

Pennsylvania, Philadelphia. J. H. Blaetz, formerly with William F. Taubel, is equipping a plant for the manufacture of children's cotton, silk and mercerized hosiery at 167 W. Oxford St. The number of machines to be installed could not be ascertained. The production will be sold through New York.

Tennessee, Johnson City. James P. Grey, Jr., of Johnson City, will build a brick knitting mill and install machinery to manufacture misses' hosiery. The product will be finished by the Freeze-Bacon Hosiery Mills of Hendersonville, N. C.

*Tennessee, Soddy. The new branch mill of the Richmond Hosiery Mills, of Rossville, Ga., will be operated under the name of the Soddy Hosiery Mills, and will have 100 knitting machines operating on seamless hosiery. Garnett Andrews, of Chattanooga, will be manager, and R. P. Steele & Company, 366 Broadway, New York, will sell the product. It was noted last week that a brick building, costing about $5,000, to have a space of 100 by 60 feet on each floor, would be built for this company.

*Canada, Ontario, London. Arrangements have been made by the Thomson Knitting Company to repair the damage caused by the recent fire and it is expected the plant will be in operation again within a short time. They manufacture men's and women's seamless hosiery. John Watson is superintendent and W. W. Thomson, buyer.

*Georgia, Gainesville. The new Merck-Hetrick Mfg. Company will install additional knitting machines for which orders have been placed. This new equipment will increase the daily capacity from 100 to 200 dozen pairs of hosiery.

Massachusetts, Boston. Plans are being made for a 3-story addition by the Suffolk Knitting Co., 16 New St., East Boston. Details have not been worked out but the enlargement will probably be 84 by 44 feet. Particulars of the new machinery to be added have not been decided. They manufacture sweater coats, jerseys and bathing suits.

*New Hampshire, Ashland. The new power plant being built by the Ashland Knitting Company near the grist mill in that town, will have one floor, 32 by 40 feet. The company proposes to use part of the water power at the grist mill dam to furnish power for their mill, and they will have a small amount of power to rent. John W. Dresser of Franklin is in charge of the work.

New York, Fonda. A manufacturing addition, including offices, 55 by 70 feet, three stories high, and a storehouse 32 by 165 feet, two stories high, will be erected for the Fonda Glove Lining Company. This concern manufactures glove and shoe linings, astrachans, stockinet, eiderdowns, and fancy knit goods on present equipment of 5 sets of cards and 40 knitting machines. George B. Stover is vice president, general manager and buyer.

Pennsylvania, Bloomsburg. Ten new knitting machines have been installed in the Bloomsburg Hosiery Mills, on account of increased business.

Pennsylvania, Newcastle. It is reported that the Newcastle Knitting Mills, manufacturers of hosiery, have increased the capacity of their bleaching department. The company recently installed new knitting machines, doubling the capacity, and orders are on hand to keep the mill running day and night for several months.

Pennsylvania, Philadelphia. E. Sutro & Sons Co., manufacturers of seamless hosiery at East Thompson and Clearfield Sts., have recently placed a contract with a local builder for alterations to a portion of their plant on E. Clementine St., the work on which will be started at once.

Pennsylvania, Boyertown. Three car loads of machinery and other equipment have been received at the local plant of the Allen Knitting Mills Company. This machinery was brought from the main plant in Philadelphia, which it is said is to be eventually moved here. More hands are being engaged.

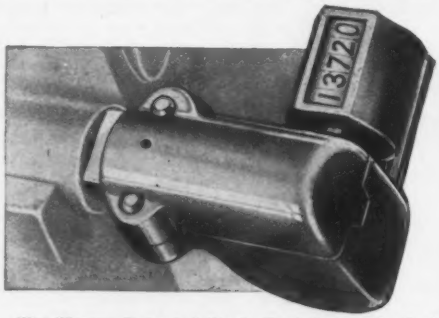
Pennsylvania, Newville. A permit has been granted the Newville Knitting Company to build a dam across Big Spring Run.

Pennsylvania, Souderton. The M. B. Bergey Company, operating 60 knitters on 108 and 84-needle hosiery, are adding another story to their present plant in which they will install 50 new 176-needle knitters for making split foot hosiery. This equipment was recently purchased.

*Pennsylvania, Spring Grove. A large amount of new equipment has been added to the Pennsylvania Knitting Mills Company and employment is being given to fifty more hands. The plant is running full time on children's and infant's hosiery.

Wisconsin, Milwaukee. The Racine Underwear Mills at Stevens Point have leased for a period of ten years a 3-story building on 12th St., near Lee St., and will move their plant from Stevens Point to Milwaukee. It is said they will start operations here with a force of 60 hands. The change was made largely for the purpose of securing better labor conditions.

A Better Hank Clock at a Lower Price



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In the General Cotton Manufacturing Course, a Diploma Course of Three years, ten graduated and received diplomas May 1915.

In the Designing and Weaving Course of two years, there were two graduates.
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In the engineering Course (Steam and Electricity) of two years, five graduated.
There have been classes and special students in Freehand Drawing and Textile Design.

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New Jersey, Paterson. A concern located at 93 River St. is manufacturing silks under the name of the Pantel Silk Company.

New Jersey, Paterson. The DeLauder Finishing Company has filed a certificate of incorporation. The incorporators are Frederick Breitenstein, business manager; Thomas DeLauder, James Gaynor and Anthony Stingle.

New Jersey, Paterson. Yolken & Keller are operating about 100 silk looms in a plant at Morton, Straight and Madison Sts. in the Dunlop Mill.

New Jersey, Paterson. The Good Throwing Company, 47 State St., has been organized with capital stock of $125,000, and has begun active operations. The equipment includes 12,000 spindles which are operated exclusively on organzine. Its output is from 3,000 to 4,000 pounds of silk a week. Several months ago it was reported that Weston E. Good, president of this company, would start up a branch plant at 47 State St., in the building purchased from the National Mill Supply Company.

New Jersey, Paterson. The Fairmount Silk Mills have been incorporated with capital stock of $50,000 to manufacture silk and other textile fabrics. The incorporators are John A. Stewart, Richard Hall, both of Paterson, and John W. Grimshaw of Haledon.

New Jersey, Paterson. Articles of incorporation have been filed by the Jacob P. Brown Silk Company, with capital stock of $20,000 to do designing, winding, warping and entering. The company has bought out the plant at 52-60 Garfield Ave., recently occupied by the Reliable Winding & Warping Company. It is equipped with 9 warping machines, 11 winders and 9 enterers. The officers of the concern are Jacob P. Brown, president; C. W. Weiss, secretary and treasurer, and Joseph Senz. These men are all experienced men in the warping business.

New Jersey, Stirling. The weavers of the Schwarzenbach Huber Co. who have been on a strike for several months, have decided to return to work. At one time the concern considered moving the machinery from the Stirling plant to other mills of the concern.

New Jersey, Summit. The Summit Silk Company reports business is very good. They are running night and day shifts and are having work done outside.

New Jersey, Trenton. The Crystal Lake Weaving Company has been incorporated to manufacture silk and other textile fabrics with capital stock of $100,000. The incorporators are Benjamin G. Demerest, Montclair; William H. Burnett, South Orange; George M. Demerest, Newark; Daniel Demerest, Woodbridge, and Arthur Vervaet, West New York.

New Jersey, Weehawken. The M. L. Flank Lace & Embroidery Company has been organized with capital stock of $10,000 to manufacture lace and embroidery, by Michael L. Flank of Cedarhurst, Long Island; Clarence E. Witzfelder of New York, and Conrad J. Ruby of Brooklyn.

New York, Bay Shore. Albert F. Mundorf, 254 4th Ave., New York, is reported to be interested in leasing the basement and ground floor of a building known as Foresters Hall for silk manufacturing purposes. The Chamber of Commerce is interested. If the enterprise comes here, it is said 35 silk looms will be installed.

New York, Cohoes. Harry B. Brooks of this place and John A. Nuttall of Valatie, have leased a factory mill here and will soon begin manufacturing.

New York, Cohoes. It is reported that the carding and spinning machinery at the Mohawk Mill of Wright's Underwear Company, which has been idle recently, will be started up again next week.

New York, Glens Falls. A concern has been organized under the name of the Imperial Color Works, Inc., to manufacture and deal in drugs, chemicals, dye stuffs, pulp colors and paints. The place of business will be at Queensbury but the post office address is Glens Falls. The capital stock is $150,000. It is understood that the new company is affiliated with the Imperial Wall Paper Company.

New York, Haverstraw. It is reported that the old Home silk mill here, which has been closed, has been reopened and looms started up.

New York, Honeoye Falls. The G. E. Barker Mfg. Company, Inc., has been organized with capital stock of $2,000 to manufacture bags, canvas, rope, etc. The incorporators are Frank J. and Elmer L. Eldridge, Honeoye Falls, and J. Frank Morse, Rochester.

New York, New York City. The California Silk Company, Inc., has been organized with capital stock of $10,000, to manufacture and act as agents for silk and textile fabrics. The incorporators are Max and Samuel Salmowitz, New York, and Max Markowitz, Santa Monica, California.

New York, New York City. A charter has been granted the Globe Textile Printing and Novelty Company, Inc., with capital stock of $3,000 to do textile printing on silks, velvets, etc. The incorporators are Williams Frieber, Joseph Willhrim and Frank Schwartz of New York City.

New York, Seneca Falls. M. F. Burke, who is in charge of the old Seneca Falls Woolen Mills property, idle for some time, has been reported to be in touch with men who might under certain conditions lease the plant, but it is not likely anything will develop.

New York, Utica. The plant of the Utica Fine Yarn Corporation has been sold to W. F. Foster, representing the original owners, and the sale has been confirmed. It is believed in some quarters that the mill will soon be started up.

New York, Whitestone. According to report a new concern known as The Elandes Ribbon Company, Inc., has been organized by Langenieux & Sopp, selling agents for silk ribbons at 334 4th Ave., New York, to operate the Atlas Ribbon Mill. Fred A. Wassermann, who was superintendent for the Atlas Ribbon Company, Inc., is an officer of the new concern and will have charge of manufacturing

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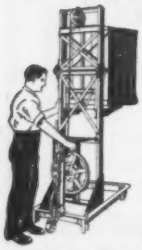

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North Carolina, Concord. The Roberta Mfg. Company is reported to be progressing with the rebuilding of its hosiery yarn mill. According to report 5,000 spindles and accompanying machinery will be installed. It was recently reported that W. W. Flowe and J. F. Goodman would purchase this business.

North Carolina, Granite Falls. D. H. Warlick is making some progress on the new cotton mill project reported last May. Mr. Warlick is secretary and treasurer of the Dudley Shoals Cotton Mill Company.

North Carolina, Mayworth. The name of the Maves Mfg. Company has been changed to the Mayes Mills, Inc.

North Carolina, Rutherfordton. It is rumored that a new cotton mill is to be built here.

North Carolina, Tuxedo. The Blue Ridge Power Company has been incorporated with capital stock of $700,000 to supply power to textile and other factories. It will begin business with $37,000 paid in. The incorporators are J. O. Bell of Tuxedo, S. B. Tanner of Charlotte, John A. Law of Spartanburg, S. C.

Pennsylvania, Chester. At the receiver's sale of the Grove Worsted Mills the real estate was purchased by T. O. Haydock.

Pennsylvania, Clifton Heights. The Thomas Kent Mfg. Company, with its stock, equipment, business, assets and liabilities, was turned over to Charles J. Webb, of Philadelphia, one of the receivers for the company, by the stockholders. Mr. Webb will be in absolute control and operate the business as his own the remainder of the present year. If at the end of that time the members of the Kent family, owners of the plant, are able to come to an agreement and take over the mill it will be turned back to them by Mr. Webb.

Pennsylvania, Harrisburg. The Harrisburg Silk Company has had a most successful year, and although an addition was built to the plant last year, it is now taxed to its fullest capacity. About 500 hands are employed.

Pennsylvania, Mertztown. The new plant of the Long Valley Rug Company, to take the place of the plant recently destroyed by fire, is being equipped and production will soon be started.

Pennsylvania, New Castle. It is reported that a concern known as the Wilmington Fibre Specialty Company has started operations at the old woolen mills here.

Pennsylvania, Philadelphia. At the receiver's sale in bankruptcy the plant of Mark D. Ring & Co., spinners of woolen yarns on 8 sets, 6,376 mule and 1,168 twisting spindles on July 12 last was bought in as a whole by Josh. Johnson. This party being unknown to those gathered at the sale for the purpose of bidding it in, it is impossible to state what will be done with the plant whether it will be started up at once or sold to other parties.

Pennnsylvania, Philadelphia. Report has it that Jere Emory, well known as a manufacturer of textile fabrics, has recently purchased a number of looms and is looking for quarters in which to install them with a view of starting up in the manufacture of woolen and worsted goods somewhere in the Frankford district.

Pennsylvania, Philadelphia. At a meeting of the creditors of the Sykes & Geiger Company, spinners of woolen carpet yarns on 2 sets and 600 spindles, with a capital of $30,000; Walter G. Sykes, president, and Warren Geiger, treasurer, it was decided to allow the company to expend a small amount to change over the machinery to enable them to run on cotton yarns. The committee claimed that this was expedient and would tend to conserve the limited assets to a better advantage, as the plant as originally laid out was not exactly suited for the manufacture of carpet yarns. It is probable that the plant will be operated in the future on commission spinning.

Pennsylvania, Philadelphia. An announcement has recently been made of the dissolution of the partnership existing between E. F. Mason and George N. Schofield, trading as Schofield, Mason & Co., and operating the Delaware Mills at Cumberland, Fairhill and Reese Sts., on Wilton and Body Brussels carpets and rugs, automobile and carriage carpets, with 130 looms. The business in the future will be conducted by a corporation of the same name, an application having recently been made for a charter a notice of which appeared in these columns.

Pennsylvania, Philadelphia. The three-story brick factory building, boiler house and storehouse at Margaret and Dittman Sts., Frankford, formerly occupied by the late firm of Edwin Holden & Co., has been sold to the Vigilant Mills at a price which has been withheld. The assessed valuation of the property is $7,000. The Vigilant Mills are well known as manufacturers of tapestry and upholstery goods at Adams Ave. and Leiper Sts., where they are operating 50 looms. Another purchase of this concern recently made by them was the old Dale Mill on Gillingham St.

Pennsylvania, Reading. The Narrow Fabric Company, manufacturers of braids and laces, are running part of their plant day and night.

Pennsylvania, Sharpsburg. A concern known as the American Hair Felt Company is reported to have opened a branch in Sharpsburg to manufacture and deal in felts, hair, fur, etc.

Rhode Island, Carolina. The carding and spinning departments of the Carolina Company are running overtime five nights a week. Woolens for men's and women's wear are manufactured.

Rhode Island, Pawtucket. It is reported that the Smith Webbing Company has been sold to Everlastik, Inc., of Boston, Mass. Everlastik, Inc., recently took over several webbing plants and consolidated them in one company. It is expected that no change will be made in the management of the local mill.

*Rhode Island, Pawtucket. The plant of the American Yarn Mfg. Company is now being offered for sale as a going concern by E. Tudor Gross, the receiver.

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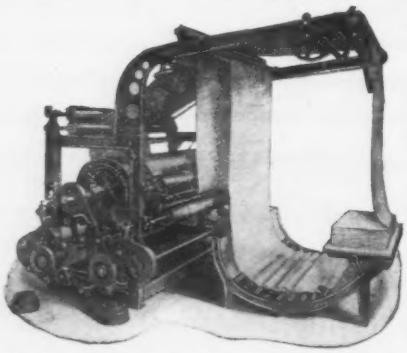

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PARKS & WOOLSON MACHINE CO Springfield Vermont U S A

Maine, Sangerville. A charter has been granted the Glencoe Woolen Co. with capital stock of $200,000 to manufacture woolens, worsteds, and other textile fabrics. The town recently voted to exempt the plant formerly operated by the Sangerville Woolen Co. from taxation for a period of ten years and it is understood that the new corporation was formed to take over and operate the plant.

New York, Watertown. The Wool Products Company, Inc., manufacturers of felts and low grade blankets, is installing new machinery by which all the work will be done in this city. Heretofore it was necessary to have the edging of the blankets sewed on by an out of town firm, but with the new machinery this will be unnecessary. Recently this concern added the manufacture of automobile robes.

Oregon, Eugene. The Eugene Woolen Mills have resumed operations after three weeks' shut down for repairs and enlargements. During this period a new dyehouse was built and new floors laid in the main mill. E. Koppe is manager and buyer.

*Rhode Island, Pawtucket. Owing to present conditions at the Union Wadding Company, a very large quantity of waste is being stored and a new $10,000 storehouse is being built to provide more space.

Rhode Island, Phoenix. Superintendent William A. Phelan of the Pawtuxet Valley Dyeing Company, announces that the plants are working overtime in order to keep up with the rush orders.

Rhode Island, Providence. Several of the local mills are running overtime. The Continental Worsted Company is operating some departments all night. As soon as the addition being made to the Langford Worsted Mills is completed, they will operate day and night.

*Rhode Island, Valley Falls. The Hansahoe Mfg. Company, which recently took over and started up the old Tilton Mills, have 1,050 looms running on white and cotton wash goods and cotton dress goods. F. U. Stearns & Company, New York, are the selling agents.

*Rhode Island, Woonsocket. Work has been started in the new worsted yarn department of the Lippitt Woolen Company, Inc. This department consists only of drawing and spinning, and tops will be bought. As noted in previous reports 2,000 spindles with preparatory machinery is being installed in the space formerly occupied by the Manchester Company. About 15 hands will be given employment. John C. Parkinson will have charge of this department.

Tennessee, Nashville. The plant of the Nashville Woolen Mill Company has been sold at auction for $27,000. The concern filed a voluntary petition in bankruptcy about a year ago.

*Texas, San Angelo. Thomas F. Owen, secretary of the San Angelo Chamber of Commerce, states that nothing definite has been accomplished with regard to establishing a woolen mill in San Angelo. Several attempts have been made on this proposition during the past three years and Mr. Owen considers the present a favorable time to become active on the project.

MILL NEWS

*California, Long Beach. It is planned to build a warehouse, 70 by 40 feet, at the plant of the Golden State Woolen Mills Company later on. The plant has just been started up, as noted in a previous report.

Connecticut, Stafford Springs. There is a possibility that the Rhode Island Worsted Co. will build a yarn mill. They manufacture fancy worsteds and piece dyes on 170 looms.

Indiana, Mexico. The Mexico Woolen Mills, Inc., are considering plans for building a new plant at a cost of from $50,000 to $75,000 and doubling the output. Knitting yarns for sweaters and underwear are manufactured on present equipment of three sets of cards and 1,200 spindles. This is a comparatively new concern which began operations about two years ago. Last fall an addition was built for use as a storeroom, dyehouse and boiler room and the capital stock was increased from $25,000 to $40,000. A further increase in the capitalization will be made if the plans to build the new mill are carried out. W. E. Edwards is president; George Wilson, treasurer, and George Dick, superintendent and buyer.

*Iowa, Nashua. An automatic wool washer, a dryer and machinery for dyeing yarns, raw stock and piece goods, will be installed in the dye house recently erected by the Nashua Woolen Mills. The other branches of the plant are to be improved and put in first-class condition. They manufacture blankets, flannels, dress goods, wool bats and yarn on 4 sets of cards and 23 broad looms.

*Massachusetts. Clinton. The new Clinton Textile Company is now operating 10 looms in the Brodfelt Mill, and orders received for worsted dress goods will result in the starting up of more looms. The mill has recently been put in order and the machinery rearranged for this company.

Massachusetts, Millbury. The Mayo Woolen Company is repairing the old knitting mill at Bramanville and within the next two months will move all the equipment from the Wheelersville plant, which is some distance away, into the knitting mill buildings. This will bring all the departments closer together.

New Hampshire, Rochester. Ten looms have been added to the equipment of the Rochester Woolen Company, manufacturers of dress goods and men's wear.

*New Jersey, Newark. Construction work will soon be started on a new two-story picker building, 45 by 100 feet, for the Basch & Greenfield Co., manufacturers of wool fiber, shoddy, flocks and wool stock. Particulars of this increase have been given previously.

*New York, Skaneateles Falls. John W. Bockes, secretary of the Glenside Woolen Mills, states that they have not been able to estimate the damage caused by the fire of last week. In an early report it was stated that the loss amounted to $100,000, of which the loss on machinery amounted to $35,000. Adjustment has not been made with the insurance companies but it is hoped to have the plant running again soon after September first, as only a small amount of rebuilding will be necessary.

Saving or Wasting?

The manner in which you handle the drinking water problem in your plant may seem to be a small matter to you —but investigate. The results will be surprising.

The old time faucet is costly. Running hour after hour, day after day, its ceaseless flow is costing you money yet without any better service.

Puro Saves 35%

A Puro Sanitary Drinking Fountain will cut that water bill 35%. We can prove that it has done that for others.

It will give every employee a safer, saner draught of bubbling water free from the contamination of the common drinking cup.

In a word, it is the only sanitary Drinking Fountain that is really safe, sanitary, simple, automatic in control and easy to attach.

"PURO-FY"

YOUR WATER SUPPLY

PURO SANITARY DRINKING FOUNTAIN CO.

127 Main Street HAYDENVILLE, MASS.

Unbiased Opinions of Competent Judges

At the Louisiana Purchase Exposition in 1904

Wyandotte Textile Soda

was given the highest award—Gold Medal—for its superiority in rendering to the textile industry most unusual service.

At the Portland Exposition, one year later, it again received the highest award. And now, after an expiration of eleven years, it is still the acknowledged leader, having just been assigned the highest award by the

Panama-Pacific International Exposition at San Francisco

Such a record is without a parallel, and no word of praise or censure can add to or detract from this indisputable record.

Are you using this unequalled textile supply? If you are not, who loses most, you, by not using it, or we, by missing the few cents of profit that we might make on your business. Think it over, and act as your judgment dictates.

Order from your supply man.

The J. B. Ford Co., Sole Mnfrs., Wyandotte, Mich.

Welcome to the Wyandotte Booth—Panama-Pacific Exposition Agricultural Bldg., Block 6, Cor. Ave. A and 3rd St.

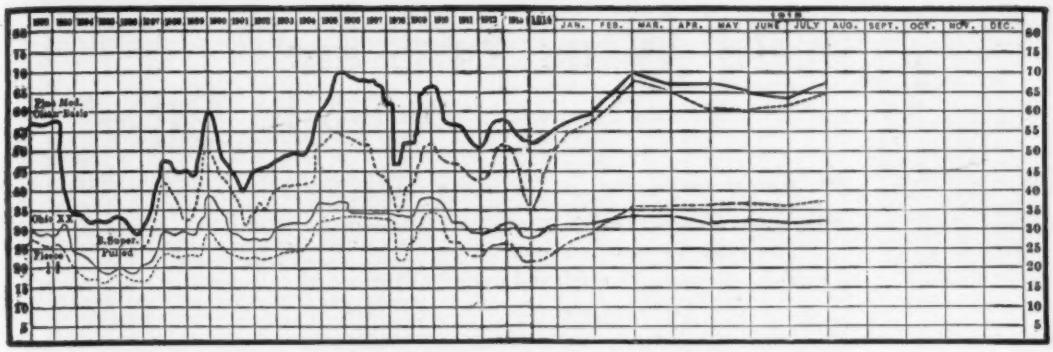

CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

THE WOOL MARKET

The market for wools still continues firm and the present indications are that prices will advance in the near future owing to the shortage in this year's clip. The supply of cross-breds is very limited, but there has been some sale in fine wools. The demand for low grades of wool is fair, the orders nearly all coming from manufacturers who are filling foreign orders for army goods. The decline in prices in the London market has had no immediate effect on the domestic market. Dealers are selling at only nominal prices, the mills as a rule buying on a hand to mouth basis. Some interest is being shown in Australian merinos at firm prices. We have been importing some fine South American wools that will cost in the neighborhood of 62 to 65 cents per pound.

The openings of the goods market in New York has shown the increase expected in prices and considerable interest manifested by buyers.

The world's supply of wool has not kept pace with the normal increase in consumption for some years past and with the great destruction of woolen goods caused by war there is no reason to expect much lower prices for wool until conditions are different.

MILL NEWS.

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Pennsylvania, Philadelphia. Porter Bros. Textile Co., Margaret and Ditman Sts., Frankford, operating 11 broad looms on men's wear and dress goods, are greatly enlarging their plant, having recently ordered a number of new looms which they are now installing.

Rhode Island, Centredale. New drawing machinery has been received by the Centredale Worsted Mills and is being set up. The work of fitting up the old storehouse with new machinery has not been started as yet. As noted several months ago the plants of the Centredale Worsted Mills at Centredale, Providence and Stillwater are being overhauled and some new machinery installed to balance the various departments and to increase the production. James Lister has succeeded W. A. Mackie as president, and James Jay Lister succeeded William Lister as treasurer, while Robert W. Lister was made secretary and assistant treasurer. James J. Lister is now superintendent of the mills.

Rhode Island, Westerly. Two additional spinning mules are to be installed in the plant of the Pawcatuck Woolen Mills. The carding and spinning departments are running overtime four nights a week. This concern manufactures men's fancy woolen suitings and overcoatings on 8 sets of cards and 50 looms. Thomas Hope is agent and buyer.

TETRAZO COLORS
FOR COTTON

We offer these products in all shades for the dyeing of cotton in any form. Among them will be found colors specially adapted to meet the various requirements of fastness to light, washing, cross dyeing and fulling. Shade cards and samples, with full information, cheerfully furnished on application.

AMERICAN DYEWOOD COMPANY
NEW YORK PHILADELPHIA BOSTON HAMILTON, ONT.

Direct Acting

Over 2000 in Daily Use

Double Geared

"Old Whiskers" and "Uncle Billy"

A Confession

So you were shocked at the "undignified and familiar" style of "those Ridgway advertisements."

For some years we spent many dollars for advertisements like the stately and very proper announcements to be found in this and other trade papers.

These expensive ads while beautifully displaying the noble name of RIDGWAY in big black letters, alas, made us no friends and brought us few inquiries and fewer orders.

Our well dressed ads were lost among the hundreds of other well dressed ads.

One day when deciding to stop spending money for advertising that brought no results we had a revelation. And this is what happened:

We took off the high hat and the evening clothes and the college education and the dignity.

And we put on a soft cap and everyday duds an I shop talk and a laugh.

So that you and everybody else who gets this paper turns to this page to see "What Old 'Hook 'er to the Biler' has to say this month."

WITH NO OTHER SALESMEN THAN THESE CARDS IN A FEW GOOD TRADE PAPERS we have made customers of the Greatest Concerns in the land.

AND EVERY CUSTOMER A FRIEND to keep on reading us and to keep on hurrahing for us.

Dignity—bah! It is all right for dress parade but it makes no Real Heart Friends.

"Old Whiskers" is what they call you in the office, mill, club and parlor—behind your back.

"Uncle Billy" is what they call me before my face and out on the farm.

Your kids call you "Father" and skip the kisses.

Mine call me "Dad" and I get the hugs.

Yes, my dear Mr. Dig, we will have to keep right on going about in our work-a-day togs so long as the other fellows are in claw-hammers—and when we open our mouth we will just keep on hollerin' old Louis Hamsher's slogan—

"Hook 'er to the Biler"

CRAIG RIDGWAY & SON CO. COATESVILLE, PA.

ELEVATOR MAKERS TO FOLKS WHO KNOW

BLEACHERS!

CHEAPNESS—has so far been the last remaining refuge of the lime bleacher.

We are sorry for him;

But we have to cut even that last prop from under his feet.

He will be left hanging in the air.

Our new system of Peroxide bleaching puts the cost on a par with lime, and without calling for new apparatus.

Of course you know that Peroxide bleaching does not tender any goods, but produces a fast white, highest elasticity and softness; no seconds.

Peroxide advice free to mills.

THE ROESSLER & HASSLACHER CHEMICAL CO.

NEW YORK

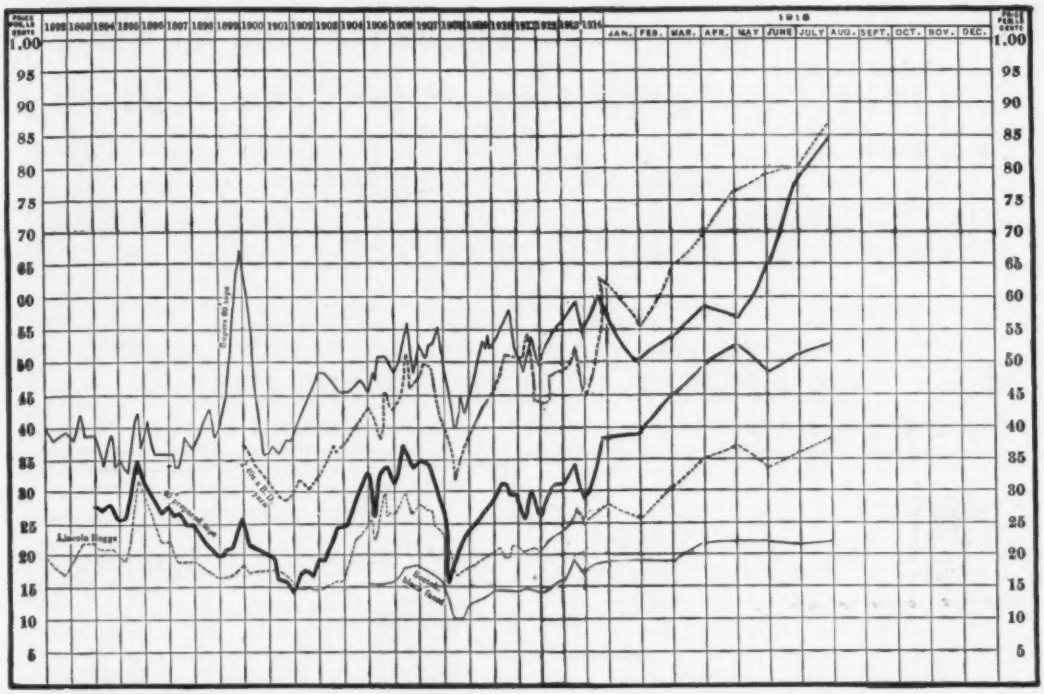

CHART SHOWING COURSE OF PRICES FOR WOOL, TOPS, AND WORSTED YARN AT BRADFORD, ENGLAND

THE BRADFORD MARKET

Merino tops are bought eagerly for near dates, but makers are not pushing business. There is perceptibly less inclination to buy and sell far in advance. The dangers of high prices have become conspicuous, both by the falling off of orders from the suiting trade and by some evidences of speculation. It is clear that considerable quantities of tops were sold at the 48-54 cent basis for 64s by parties who had not covered in raw wool and spinners who had sold yarn on the faith of these contracts have had to face the risk of failure on the part of the supplier of losses of 40 to 50 cents a pound. Failure either of the supplies or of the consumer produces serious consequences when 64s are at 90 cents.

The consuming trades have been disarranged severely by the cancellation of a contract for French army cloth. New military orders for cloth and hosiery are absent and without the support of military contracts crossbred is dangerously dear. Holders of either merino or crossbred decline to be frightened into reducing their prices, but there is appreciably less chance of further advances than was the case over one month ago.

English wools have again risen in the country and in Bradford and their prices are sufficiently high to deter dealers from buying freely.

It does not appear that any important business has been done upon the samples of American tops that have been shown to Bradford spinners. A change of source is regarded as a great risk and the margin between Boston and Bradford quotations has not presented a large enough temptation. Failure at the first attempt does not preclude all chance of business supposing prices to remain as high and combs as overloaded as at present, but there is now no question of stepping forthwith into the confidence of the principal users.

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Pennsylvania, Chester. Plans have been prepared for new additions and alterations to the plant of the Thurlow Worsted Mills, owned and operated by Fred. Wolstenholme, with offices on Letitia St., Philadelphia, on Bradford spun weaving and knitting yarns with 4 cards, 3 combs and 3,000 spindles. W. E. S. Dyer, mill architect and engineer, who has the matter in charge, is asking for bids on a new fire escape tower, a brick tower for the supporting of a 25,000 gallon tank to supply water for a sprinkler system, together with other alterations and additions. It is also said that a new scouring plant will be installed, capable of handling 5,000 pounds of material daily.

Save 40% of your Breakage in Winding by using

TRADE MARK
"NIGRUM" graphite impregnated Skewers and Dowels
REG.U.S.PAT.OFFICE

Nigrum Dowels run smoothly, require no oiling, last forever, and cost but little more than your old style.

We are also manufacturers of "NIGRUM" Oil-less Saddles and Bearings as well as the famous TRADE MARK "BOUND BROOK" REG.U.S.PAT.OFFICE Graphite and Bronze Bearings for heavy work

We are specialists in Oil-less Bearings. All Genuine Graphited Oil-less Bearings have always been made at Bound Brook, N. J., in the United States of America.

Send for our interesting descriptive booklet "Oil-less Bearings"

GRAPHITE LUBRICATING CO.

No. 2 Church Street **Bound Brook, N. J.**

We Specialize in the Design, Manufacture and Erection of

Elevated Steel Tanks and Standpipes

For Factory Service and Fire Protection.

We also build Oil Tanks, Buildings and Structural Material.

Write our nearest office today for illustrated catalog No. 46

CHICAGO BRIDGE AND IRON WORKS

SALES OFFICES

8194 Hudson Te minal Bldg. - New York
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1698 Prætorian Bldg. - - - Dallas, Tex.
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SHOPS

Greenville, Pa. (Pittsburg Dis't)
Chicago, Illinois
Bridgeburg, Ontario, Canada

Our Automatic

Roving Can Spring

Made of fine quality spring wire adjusted to the same tension, The plate or follower is made of IXXX tin plate with rounded edges, avoiding all wear on the sides of the can. A half inch hole in the center of the plate prevents suction. The spring for satisfactory service.

Write for prices.

James Hill Mfg. Co.,
Providence, R. I.

The Adjustable—High Speed PERKINS FAN

Is durable and noiseless. All around efficiency has been accomplished by years of experience. A fan for every need.

ADJUSTABLE—the blade arms may be set at any angle desired—blowing in or out.

DURABLE—steel frames, steel drums, steel arms and steel shafts.

HIGH SPEED—our self-oiling journal box reduces the friction.

We build our fans in many styles for a great variety of requirements.

We install complete transmission systems for fans in any position.

Our complete Catalog 85B mailed free on request

B. F. Perkins & Son, Inc., Holyoke, Mass.

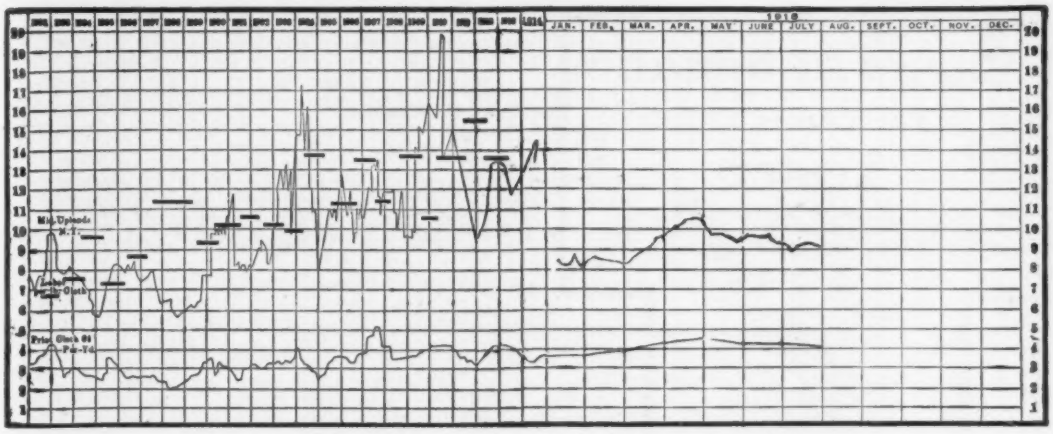

CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE

The short, heavy, horizontal lines indicate the size of the cotton crops in millions of bales.

THE COTTON MARKET

During July the price of cotton ranged within narrow limits. The highest price of Midland Uplands in New York was 9.60 cents on July 1, ranging from that down to 8.90 cents in the middle of the month and gradually working back to 9.25 and then off again. This is the season when caution prevails, for crop reports and the weather are influential factors. Exports during the month were small and there is much grumbling in the South at the British embargo on cotton in the Continent of Europe. There is some dread that the situation be rendered still more acute should cotton be declared contraband as some of the English journals are advocating. The English Government does not appear to favor this radical step and it has been suggested that in the event of cotton being declared contraband Great Britain should buy and store in the South the amount equivalent to Germany's ordinary takings of the American crop. This would involve an enormous sum, but the imagination has already been staggered by the tremendous sums raised for war purposes and a few hundred million more or less may not matter when billions have to be raised.

American spinners have been buying rather more freely on the decline. With the general knowledge of the big stocks on hand in the South and the possibility of still further curtailment of exports the bears are looking for still further lower prices even though the present price may be close to the cost of production. The weather reports for the first of the month have been generally favorable and while there is quite a reduction in acreage a large crop is still possible. The movement into sight from August 1 to July 23 is reported by the "Chronicle" for the last two years as follows:

1914-15 July 23	15,240,982
1913-14 July 24	14,846,604

The same authority estimates the world's visible supply on July 23 at 4,966,809 bales, as compared with 3,403,501 on the corresponding date of 1914; 2,770,943 bales in 1913 and 2,659,325 bales in 1912.

MILL NEWS

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*Georgia, Augusta. William A. Lee of Brooklyn, recently reported as establishing a press cloth mill here, has leased a brick building, 320 by 36 feet, and will install mill machinery costing about $8,000, a 30 h. p. electric motor, belt drive, etc. The cloth to be produced is for cottonseed crushers, linseed-oil crushers and soap manufacturers.

*Georgia, La Grange. Construction work is progressing on the building for the new Hillside Cotton Mills, and will be finished about November 1. The main mill will be 315 by 132 feet, 3 stories high, and T. C. Thompson & Bros., Charlotte, and Birmingham, have the contract, as noted previously. The mill will contain about 21,000 spindles, and 176 cards, with capacity of about 120,000 pounds of 8s to 24s cotton yarns. The organization of this company with capital stock of $500,000 has been noted previously. C. V. Truitt is president; S. Y. Austin, vice-president and general manager; Fuller E. Callaway, treasurer, and J. A. Perry, secretary. J. H. Lane & Co., New York, will be the selling agents.

*North Carolina, Gastonia. T. C. Thompson & Bros., Birmingham and Charlotte, have been awarded the contract for the erection of the new 12,000-spindle mill for the Rex Spinning Company, recently organized. The plans call for a main building, 150 by 300 feet, and 30 or 40 bungalows for operatives. The new company will have capital stock of $500,000, and the incorporators are C. M. Dunn, formerly connected with the Dunn, Clara & Armstrong Mills as superintendent, manager; and John C. Rankin of Spencer Mountain. Fine yarns will be manufactured.

*Alabama, Alabama City. No additions will be made to the buildings of the Russell Mfg. Company, Inc., but 912 more spindles with accessory machinery will be set up in the present mill.

Alabama, Langdale. The new No. 3 Mill of the West Point (Ga.) Mfg. Company will be located at Langdale, near Mill No. 1. As noted in a pre-

Baer's Automatic
Yarn and Cloth
Tester
MOTOR DRIVEN

Sold Exclusively Through
ALFRED SUTER
Textile Engineer
200 Fifth Ave., New York

The Metallic Drawing Roll Co.
INDIAN ORCHARD, MASS.
MANUFACTURERS OF
Metallic Rolls

Especially adapted for Cotton Mills. 25 to 33 per cent more Production Guaranteed. Weight Reduced 33 to 50 per cent. No Leather Covering Bill.
WRITE FOR PARTICULARS

vious report J. E. Sirrine, of Greenville, S. C., is the architect-engineer and has prepared plans for a 3-story spinning mill, 428 by 132 feet, with a weave shed, 325 by 132 feet, to be equipped with 25,000 spindles and 600 looms. This equipment will represent an investment of about $500,000. The product will be cotton duck.

*Alabama, Sylacauga. The work of changing over the Eva Jane Mill from steam to electric power is progressing, 80 motors having already been installed. The plant is in full operation.

*Alabama, Sylacauga. Additions beng made to the equipment of the Marble City Mills consist of 1,000 spindles with preparatory machinery. It was reported previously that 2,000 spindles would be added.

Connecticut, Danielson. A 1-story addition is being built at the plant of the Connecticut Mills Company, manufacturers of fine Sea Island and Egyptian tire fabrics.

Connecticut, Killingly. Directors of the Killingly Mfg. Company are expected to take action next week on a plan to enlarge the plant. Improvements have been practically continuous since this mill was reorganized and started up by the present owners. Tire duck is manufactured.

Georgia, Athens. It is reported the Southern Mfg. Company will increase its capacity for the production of fleece lined cloth, waterproofed on one side, to be used in the manufacture of gloves. The contract has been let to T. W. Broxton for the addition, and the company has ordered looms. Husking cloth and Canton flannel is manufactured at present.

*Georgia, Columbus. Reports that further improvements are to be made on the power department of the Eagle & Phenix Mills have been exaggerated. The amount to be expended will not run over $5,000. The electrical equipment which was installed last year represented an investment of over $80,000.

*Georgia, Dalton. It is reported that contracts have been awarded to the Gallivan Building Co., of Greenville, S. C., by the Crown Cotton Mills for the enlargement to Mill No. 2, which will more than double the capacity. As noted in previous reports the additions will include a 2-story mill, 160 by 125 feet, a weave shed, 250 by 100 feet, with warehouses, cottages, etc., costing approximately $75,000. New equipment to be added will include 15,000 spindles with looms and preparatory machinery, making a total of 50,000 spindles in the mills. George W. Hamilton is president; F. T. Hardwick, treasurer, and G. W. Hamilton, Jr., superntendent and buyer.

Georgia, Griffin. The Georgia Mfg. Company has placed contracts for a small increase in equipment.

*Kentucky, Maysville. Rebuilding operations on the burned portion of the plant of January & Wood Company are under way. When this work is completed the plant will be much larger than before the fire. Twines, lines and coarse cotton yarns are manufactured and some additional machinery will be required.

Cutting Dies

— FOR —

"Straight Line" Cloth Analysis

And Determining Average Yarn Number of Fabrics

The "straight line" method of cloth analysis has been used by us for years. It is equally well adapted for cotton, woolen, worsted or linen fabrics.

The value of this method is conclusively demonstrated by the fact that the U. S. Treasury Department has recommended it to Customs Collectors and Appraisers as the simplest method of determining the average yarn number on which the tariff on cotton cloth is based.

The sample having an area of 1/300th square yard (4.32 square inches) can be cut in any form desired. The rectangular die shown in the illustration is what we have found convenient.

For the convenience of the trade we have arranged to supply dies like this at $5.00 each (F. O. B. Boston). This includes instructions for use.

Having cut a sample of cloth with this die and weighed it on an ordinary grain scale, calculations to obtain the following information can be quickly made for cotton, woolen, worsted or linen:

Average number of yarn: woolen runs or cut; worsted, cotton or linen number.
Number of each kind of yarn.
Grains per square yard.
Ounces per running yard.
Ounces per square yard.
Running yards per pound.
Square yards per pound.
Number of yarn when spun.

This method of calculation is invaluable for analyzing fabrics that are to be duplicated or imitated.

The United States appraisers and custom house officers use a system based on similar data, and these calculations will be in constant use by importers who wish to know what the duty will be on cotton cloths imported, and by domestic cotton manufacturers who wish to ascertain what the duty will be on competing foreign goods similar to goods of their own manufacture. We do not supply the grain scales, but these may be bought of any supply house

Textile World Record, 144 Congress St., Boston, Mass.

—OR—

Alfred Suter, 200 Fifth Avenue, New York

MERCERIZED YARNS

Dyers, Bleachers, Gassers

Dyers of Colors Fast to

SUN AND BLEACHING

Aberfoyle Manufacturing Company

CHESTER, PA.

402 Morris Building
Philadelphia

746 Insurance Exchange
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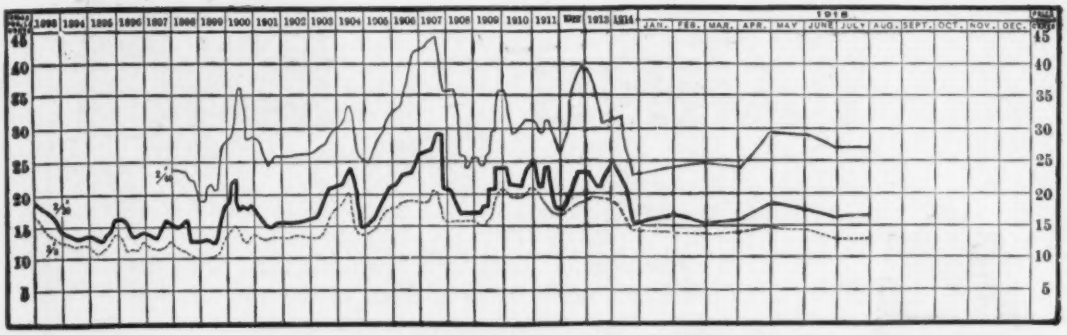
Yarn Department



GRAPHIC CHART SHOWING RANGE IN THE PRICE OF COTTON YARN TO DATE.

THE COTTON YARN MARKET

The cotton yarn market was dull during the month of July. Here and there sales have been made of good size, but with hardly an exception at prices below spinner's quotations. In fact spinners claim that quotations in Philadelphia today are less than the actual cost of manufacturing. The scarcity of dyestuffs has become a serious matter in a good many lines and helps to the conservative attitude. It would seem that yarns today are cheap and there are many reasons why an advance of from one to two cents a pound might come very quickly and under these conditions manufacturers who can foresee their future needs would make no mistake in buying at some of the prevailing quotations. One encouraging note in the market today is the business which some manufacturers have obtained for export and this with even a normal domestic demand should have a considerable effect upon business conditions. Here and there an optimistic manufacturer is predicting that the only thing he fears is a scarcity of labor during the coming fall.

The heavy weight underwear business seems to be strengthening considerably, due to the fact that at this time of the year the manufacturers are supposed to be at the height of their season. Nearly every New York State knitter of heavy weight goods is running his plant full and even though they are so busy their purchases of yarns are being made very sparingly for the reason that their buying for summer delivery on yarns were made during March and April. There is, however, a bright prospect ahead for some good trade during the months of August and September on yarns in counts from 10s to 14s. The trade on light weight yarns has been very scarce, but there has been some future delivery business taken at extremely low prices, these sales being made at prices which are not at all attractive to the spinners and it is a question whether these sales will be placed with the spinners because of the fact that the spinner today firmly believes in a strengthened market condition for future months.

Mercerized yarns are selling in fairly good quantities, in fact a good many of the mercerizers report business on their books from almost all branches of the knitting trade. Coarse gauge hosiery yarns seem to be at a standstill on account of the condition of dyestuffs holding this branch of the business up.

Eastern Cops

6s	15¾
8s	15¼
10s	16¾
14s	16¾
16s	17¾
18s	18¼
20s	18¾
22s	18
24s	18¾
26s	20¼
30s	21¼
34s	23
36s	24
40s	25
12s	17½
14s	18
18s	19
20s	20
24s	21
26s	22
30s	23
36s	25½
40s	27½
45s	31½
50s	33½

SPUN SILK YARNS

We specialize on 2 and 3 ply Spun Silk yarns in all sizes put up on cones, tubes, spools or skeins in the grey or dyed. Let us figure on your requirements.

Nonotuck Spun Silk is made in the same mill, under the same careful supervision as the famous Corticelli Spool Silk, which has won 40 Highest Awards for superiority at Expositions at home and abroad. Send for samples.

Nonotuck Silk Company

Corticelli Silk Mills Established 1838 Florence, Mass.

THE J. R. MONTGOMERY CO.

Windsor Locks, - Conn.

MANUFACTURERS OF

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools, Tubes and Cones. In Fancy Twist, Colors and Printed.

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

MONUMENT MILLS, HOUSATONIC, MASS.

HIGH GRADE COTTON YARNS White, Colors, Bleached

On Beams, Jack-Spools, Cones, Skeins and Chain Warps

FAST-BLACKS & COLORS { For Woolen Mills a Specialty } WE SELL DIRECT

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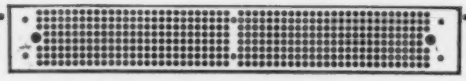
HIGHEST GRADE BEST VALUE

Mills RAINBOW, CONN.



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THE MERWIN PAPER CO

Address HARTFORD, CONN.

55s	39½
60s	42½

Eastern Two-Ply Warps, Carded Peeler

2/30s	23½
2/36s	25
2/40s	28
2/45s	32½
2/50s	34½
2/60s	43½

THE PHILADELPHIA MARKET

7s and coarser	15
8s and 9s	15
10s	15½
12s	16
14s	16½
16s	17
18s	17½
20s	18
22s	18½
24s	19-19½
26s	20
30s	21
40s	26
50s	34

Southern high grade mule yarns:—

Cones

10s	17½
12s	18
14s	18½
16s	19
18s	19½
20s and 22s	20½-21
24s	22

Southern frame yarn, lower grades:—

6s and 8s	14¾
10s	15

Eastern cones (high grade quality):—

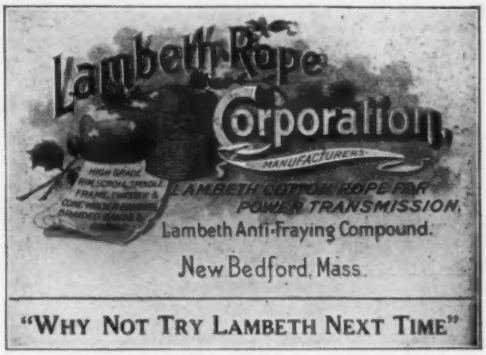
10s	18
12s	18½
14s	19
16s	19½
18s	20¼
20s and 22s	20¾-20¼

Skein yarn (mostly Southern):—

4s and 8s soft	14½
10s and 12s	15-15½
14s and 20s	15½-16½
22s	17
10/2	15
16/2	15½
20/2	16½
30/2	19
40/2	26
50/2	33
60/2	40
8/2	15
7/6	15

Southern warps:—

10/1	14½
14/1	15



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Cotton Yarns
PROVIDENCE, R. I.
Providence, Chicago, Philadelphia, New York

Fred Sternberg & Co.
530 BROADWAY, NEW YORK
MERCERIZED GLAZED GASSED } COTTON YARNS

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Manufacturers of
Twines, Threads and Yarns
Jacquard Harness Twines of all kinds on hand and made to order
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COMMISSION MERCHANTS
COTTON YARNS
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Reels for Cotton WOOLEN AND WORSTED
Patented Hosiery Winders, Cop Winders and Spoolers
LINDSAY, HYDE & CO.,
2124 to 2130 E. York St., PHILADELPHIA, PA.

FIBRE-COVERED SHUTTLES
OF EVERY DESCRIPTION * * * ALSO IN PLAIN
OTTO KUNZE, 2542 Seventh Ave., New York.

S. T. Crocker, Pres. W. F. Stiles, Treas.

ORSWELL MILLS

FITCHBURG, MASS.

Capacity, 45,000 Spindles

HIGH GRADE YARNS

From Egyptian and Peeler Cotton, Carded or Combed, in Chains and Skeins, on Balls, Beams, Spools, Cops, Cones, Tubes, Single or Twisted

JENCKES SPINNING COMPANY

PAWTUCKET, RHODE ISLAND

COTTON YARNS

CARDED and COMBED, in Nos. 10 to 120, from PEELER EGYPTIAN and SEA ISLAND COTTONS
MERCERIZED YARNS, IN SINGLE OR PLY, A SPECIALTY

LINDSAY THOMPSON & CO., LTD.

FLAX SPINNERS BELFAST, IRELAND

Linen Weaving and Knitting Yarns

LINEN THREADS OF EVERY DESCRIPTION

T. J. PORTER & SONS Large Stocks
Selling Agents, Philadelphia Quick Delivery

HUGHES FAWCETT

115 and 117 Franklin St., New York

Linen Weaving and Knitting Yarns

Linen Jacquard Harness Twines

And Linen Yarns and Threads for every purpose

Turkey Red Yarns

LARGE STOCK PROMPT DELIVERIES

Industrial Tape Mills Co.

Jasper and Huntingdon Sts. Phila., Pa.

Manufacturers of

NARROW FABRICS

SPOOL TAPES. STAY BINDINGS AND BRAIDS

Also Sole Manufacturers of

SAXON

New Guaranteed Non-Shrinkable Tape

F. W. MAURER & SONS CO.

MANUFACTURERS OF

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Office and Factory: WAYNE AVE. and BRISTOL ST.
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WRITE — FOR SAMPLES AND PRICES ON SEWING AND SPLICING THREADS IN ALL COLORS TO → TO FLORENCE

HOSIERY AND UNDERWEAR MAKERS WHO WANT TO MATCH COLORS — WRITE →

THREAD CO.
FLORENCE, N.J.

WEIMAR BROS. MANUFACTURERS OF **Cotton Mercerized Tapes**

SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES

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MANUFACTURERS OF

Silk, Cotton and Mercerized Narrow Fabrics

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TELEPHONE CONNECTION OFFICE AND MILL ALLEGHENY AVE. AND EMERALD ST., PHILADELPHIA

The Ramie Agency

Manufacturers' Agents

New York

Ramie Yarns and Threads

HAVE REMOVED

TO NEW AND LARGER QUARTERS AT

432 FOURTH AVE. Corner of 29th St.

16/1	15½
20/1	16
22/1	16½
26/1	18½
30/1	21
8/2	15
12/2	15½
14/2	16
16/2	16
20/2	17
26/2	18½
30/2	20
40/2	29
50/2	33

THE LINEN YARN MARKET

Reports from Belfast state that it is exceedingly difficult to give any adequate idea regarding the linen yarn market, but certainly the demand for coarse yarns is increasing owing to the demand for cloth made from 30s down, and also in the finer grades, because of the likelihood of the supply ceasing altogether for want of suitable material. Large government contracts are being competed for and as these are generally in coarse numbers, large quantities of flax will soon consume the stock of raw material on hand. It is hardly probable large quantities of Italian hemp will be used as a substitute in the lower numbers as it will be impossible to fill any large orders from the present supply of flax, which has increased in value very considerably. The recent arrivals from Archangel have somewhat relieved the situation, but it is still difficult to quote firm prices even with Russian flax 100 per cent. higher than it was at the outbreak of the war. Some lots of better selections of flax have recently been received from France, but the quantity has been so small that it is hardly worth while mentioning it. The weather has been exceedingly favorable for the Irish crop which will soon make its first appearance in the market. It is hoped that the quality will be good, but the quantity cannot be much above the average.

("A" Quality)

35s Lea on cones	1.00
50s Lea on cones	1.05
60s Lea on cones	1.10
80s Lea on cones	1.15
90s Lea on cones	1.20
100s Lea on cones	1.35
110s Lea on cones	1.45
120s Lea on cones	1.80

Pennsylvania, Waynesboro. John Eder of Hagerstown, Md., has purchased the knitting mill here formerly operated as a branch plant by J. C. Roulette & Sons. of Hagerstown, and will start it up in a short time. This mill has been idle for over a year.

You know your production but—

Do you know what each machine, each operator, produces each day and each hour?
Do you know which men are money makers?
Do you know just where each job stands whenever you want to?

Durant Counters

Give you these exact figures which you need for economy in production and accuracy in cost calculation. Thirty styles, thirty days' trial. They have solved counting problems for your competitors.

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Durant Mfg. Co., Milwaukee, Wis.
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WORLD'S LEADING MANUFACTURERS OF

Flat Steel Heddles and Frames

Drop Wires and Heddles — Doup Heddles
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Specialists in Metal Punching

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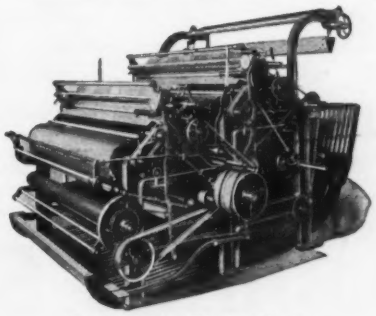
Philadelphia, Pa.

Wool Burring and Picking Machinery
Cloth Finishing Machinery



Double Cutter Woolen Shear

CURTIS & MARBLE MACHINE CO., WORCESTER, MASS.

MILL NEWS.

Massachusetts, Fall River. It is reported the Sagamore Mfg. Company is preparing for the installation of its new equipment of 30,000 spinning frames, and will take out the old frames now in No. 2 mill on North Main St.

Massachusetts, Lowell. Contract has been let and preliminary construction work has been started on a new 10-story reinforced concrete storehouse for the Appleton Company. The building will have every modern improvement and will be especially well equipped as to elevator service and freight facilities. This equipment will cost about $75,000. The Appleton Company is operating to full capacity and will not close the week of July 5 as one or two other local corporations are doing.

*Massachusetts, New Bedford. Foundations are being put in for the enlargements to be made at the Kilburn Mill. It was noted several months ago that plans had been made for a mill 160 by 140 feet, three stories high and basement of brick construction, also a storehouse 100 by 120 feet. 3 stories high, brick, and alterations in the power department. It was stated the cost of the construction would be about $150,000. J. W. Bishop Company of Worcester were awarded the construction contracts.

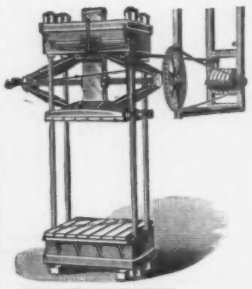
Massachusetts, Saundersville. In addition to the small enlargement recently noted the J. W. Bishop Company will erect a brick boiler house for the Saunders Cotton Mills at the cost of about $4,000.

Massachusetts, Taunton. A large new 1500 lb. skein mercerizing machine has been contracted for by the N. E. Cotton Yarn Co., who will install it in their Dept. 11.

Massachusetts, Williamstown. It is announced that the Greylock Mills will be equipped with sufficient machinery to increase the output by 20 per cent. The new machinery will be installed and ready for operation on September 10. The main office of this company is at North Adams. Charles Morton is the local superintendent. It has been rumored and denied that an addition may be built to the mills during the coming year.

New Jersey, Newark. The Clark Thread Co., who are increasing the equipment of their mercerizing department, are installing a special machine recently built for them for the purpose of mercerizing skeins up to 90 inches.

North Carolina, Albermarle. The new mill of the Wiscassett Mills Company is nearly ready for the installation of machinery. As reported recently this company will install 12,000 spindles and preparatory machinery in No. 5 mill, now under construction. It is rumored locally that work will be started on one of the largest knitting mills in the state this coming fall or winter.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ARE THE STANDARD

Hydraulic or Knuckle Joint

Any Size Any Power

Boomer & Boschert Press Co.

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B & C

TRADE MARK

BARBER-COLMAN COMPANY

MAIN OFFICE AND FACTORY

BOSTON MASS. ROCKFORD ILL GREENVILLE S C.

HAND KNOTTERS AND WARP TYING MACHINES

Dobbins Soap Mfg. Co.

PHILADELPHIA

Makers of Soaps Especially Adapted for All Kinds of Textile Mfrs. Use. Send for Sample.

MILL NEWS

*North Carolina, Concord. The rebuilding of the Roberta Mfg. Company will be completed and the production of goods started about October 1. Hosiery yarns will be manufactured, 10s to 18s. This plant was recently purchased by J. F. Goodman and W. W. Flowe. The company has capital stock of $50,000, paid in, and J. F. Goodman is president; W. W. Flowe, treasurer; and P. M. Keller, superintendent and buyer. C. W. Johnston will sell the product. About 3,000 ring spindles will be operated at first by water and electric power. The Southern Power Company has recently extended its lines to the plant.

North Carolina, Franklinville. A new addition to the plant of the Franklinville Mfg. Company is to be built and construction work has already been started. When completed the output of the mills will be considerably increased. Recently the capital stock of the company was increased.

North Carolina, Gastonia. Construction contract has been awarded by the Gray Mfg. Company for an addition which will give about 16,000 square feet of floor space and it is reported that new machinery, including 4,000 spindles, will be installed. The Gray Mfg. Company manufactures 2/40s to 2/80s combed peeler and Egyptian yarns on present equipment of 10,700 spindles, using electric power. J. H. Separk is secretary, treasurer and buyer. It was reported several months ago that Mr. Separk and J. L. Gray, the superintendent of the plant, would build a new 5,000 spindle yarn mill.

North Carolina, Kannapolis. The Cannon Mfg. Company has awarded a contract to T. C. Thompson & Bro., of Charlotte, for the erection of 75 bungalows for operatives.

North Carolina, Long Island. About $20,000 will be expended by the Long Island Cotton Mills to improve the water power and add a department to manufacture cotton rope. The capital stock will be increased.

North Carolina, Spray. Contracts have been awarded by the Thread Mills Company, controlled by Marshall, Field & Company, Chicago, and operating the American Warehouse, the Lily Mill, the Nantucket Mills, the Rhode Island Mill, and the Spray Mill of Spray, and the German-American Mill of Draper, to the Gallivan Company, calling for the construction of a 3,000 h. p. central steam power plant for which P. F. Sheldon & Sons, Providence, R. I., made plans several months ago, a bleachery, a fine weaving mill of 500 box looms at Spray, and a wide sheeting mill of 1,000 looms at Draper. These enlargements will represent an investment of about $500,000.

*North Carolina, Troy. The new equipment consisting of 180 automatic looms ordered by the Smitherman Cotton Mills is to replace old looms.

RATS AND FIRES

72 Front Street, New York City.

To Mill Owners and Superintendents:

A serious fire was caused last month in a New England textile mill as a result of a rat having knawed off the insulation from two feed cables. Its body got across the mains in such a manner that it became thoroughly carbonized which resulted in a dead short circuit putting the power plant out of commission temporarily as well as causing a fire which might have destroyed the plant. You must be aware that no building is properly fire-proofed unless it is free from rats. We know the habits of rats and we understand how to get rid of them. We will be pleased to contract to keep your premises rid of rats by the use of the wonderful bacteriological preparation known as DANYSZ VIRUS. Write today for our latest booklet. Yours truly,

Department 4 VIRUS LIMITED INC.

JOHN E. KENDRICK, President MYRON FISH, Treasurer M. C. FISH, Secretary

American Supply Co.

Manufacturers of Reeds, Harness, Belting and General Mill Supplies

We make a specialty of Harness for American Warp Drawing-in Machine

OFFICE and STORE—135-137 Washington St., Providence, R. I. FACTORIES—Central Falls, R. I. and Fall River, Mass.

Thread and Silk SPOOLS of any description

Made from one piece, up to 6″ long and 3″ dia.

We are located in the best white birch region. Our work and prices seem to satisfy the most particular customers. We can give any finish desired. Estimates furnished on samples submitted

E. L. Tebbets Spool Company, Locke's Mills, Maine

SMITH & FURBUSH MACHINE CO.

PHILADELPHIA

Manufacturers of

PICKERS - Lumpers; Rag, Burr, Wool, Cotton, Jute, Fearnaught and Garnett Pickers; also Rag, Carpet and Jute Shredders.

WILLOWS—Continuous Cotton Stock Opening, Cleaning, Metal Extracting and Condensing Outfit; also Square Box and Cone Willows or Dusters.

GARNETT MACHINES — For carding cotton and woolen waste clippings, etc.; also for manufacturing cotton, wool and jute batting or felts.

FEEDS—Self feeds for cotton, wool, worsted or jute; also Camel Backs, Blamires and Apperlys.

METALLIC BREASTS — Burring Machines and Self-Stripping Feed Rolls for Cards and Garnett Machines.

RECLAIMING MACHINE — For Opening and Cleaning various kinds of Cotton Mill Waste.

CARDS—Woolen, Worsted, Cotton Waste, Shoddy, Hair, Asbestos and Jute Cards; also Special Cards for the manufacture of Wool Hats.

MULES — Heavy and Durable for Wool and Waste Yarn.

TWISTERS—Plain or Fancy Twisters for Flake, Loop or Bourette Yarn.

BOBBIN WINDERS—Automatic Jack Bobbin Builder and Adjustable Creel for different length spools.

WARPING MACHINERY — Copper Cylinder Warp Dressers with single and double size pans; beamers; Section and Pinless Warp Mills, Creels and Dresser Spoolers for Wool or Worsted.

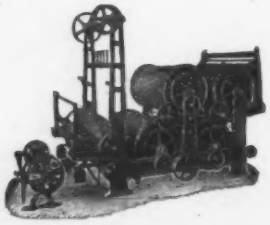
GRINDERS, Etc.—Floor, Traverse and Portable Grinders for Cards, Garnetts or Rag Pickers; also Turning Rests, Fillet Winders, Card Clothing Stretchers and Cleaning Frames.

Special Circulars furnished for each Machine

Felting Machinery for Manufacturing Soft Felts or Commercial Batts, for Mattresses, Comforts, etc. from Cotton, Cotton Waste, Linters, Jute, Wool and Wool Waste

A complete line of Machinery for Manufacturing Gunny Bagging from Old Gunny Bagging
Complete Equipment for Manufacturing Mop Yarn and Rope from Cotton Waste

Estimates and complete plans furnished



Improved

Warp Dresser

for sizing worsted or woolen warps

Built with one or two size pans

Circular R-74

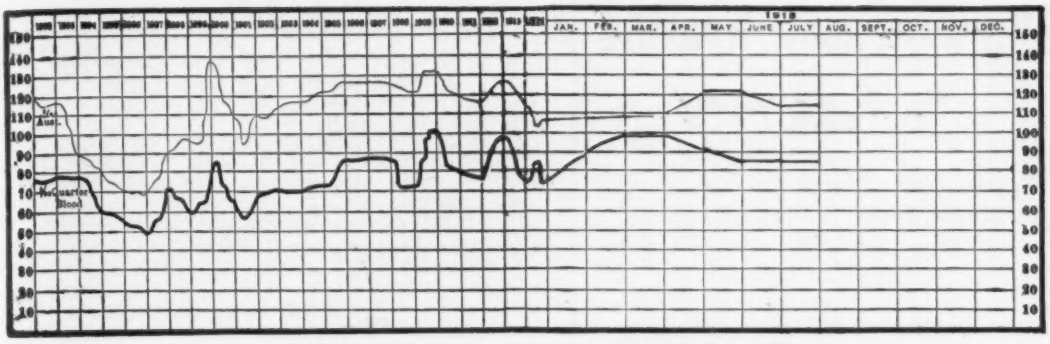
Four Copper Cylinders with improved stuffing boxes

Piping arranged so that the first cylinder is the coolest and each succeeding one slightly hotter

Copper-bladed Carrier rolls prevent yarn from sticking

Anti-friction roller bearings for each cylinder

We build complete outfits for Warping, including: Creels, Heck Stands, Reed Stands, Warp Mills, both section and pinless, Beamers, Dresser Spoolers, etc.



GRAPHIC CHART SHOWING RANGE IN PRICE OF WORSTED YARN.

WOOLEN AND WORSTED YARN MARKETS

The condition of the worsted yarn market is in better shape than for several months and spinners are rather independent, as the manufacturers are becoming busier every day and of course not only making inquiries for yarns, but buying steadily from both the French and Bradford spinners. Prices are high and are going higher, caused by the demand from the weaving trades and the scarcity of raw stocks, 2/40s and 2/50s principally, and single 20s, 25s and 30s in half bloods being the yarns called for and on these counts the spinners are becoming busier every day. Inquiries from abroad for yarns have also had a tendency to hold prices firm. Yarns which are offered in May and June at $1.00 with no sale, are being sold today at $1.10, an increase of 10 cents per pound and for 2/50s which sold for $1.10 the spinner is now asking $1.17 1/2 to $1.20. One spinner in this vicinity is reported as being sold up entirely on this particular number at $1.12 1/2. In the words of one agent in Philadelphia it has been hardly possible for the past few months to interest the trade in yarns of any kind or at any price, while today we are in the position where raw stock is becoming scarcer, prices going up and the manufacturer who is busy is now buying yarns in order to cover his wants before a further increase is made and cover his orders.

Knitting yarns are also decidedly higher in price than they have been for several months and manufacturers anticipating a further increase are placing their orders now with a view of getting their supplies at today's prices. The inquiries and orders placed call for 2/16s to 2/30s one-quarter bloods, mostly dyed, with some little yarns in the grease and the outlook for business from this line of trade is reported as exceedingly good.

BRADFORD SPUN YARN

2/12 to 2/16 low common	77½-80
2/20 to 2/24 low 1/4	80-82½
2/20 to 2/25 1/4 blood	82½-85
2/26 to 2/28 1/4 blood	85-87½
2/32 1/4 blood	85-87½
2/20 3/8 blood	87½-90
2/26 3/8 blood	90-92½
2/32 3/8 blood	92½-95
2/36 3/8 blood	97½-1.00
2/40 1/2 blood	1.05-1.07½
2/40 delaine	1.07½
2/50 delaine	1.12½-1.15
2/40 Australian	1.10-1.12½
2/50 Australian	1.20-1.22½
2/60 Australian	1.27½-1.30
3/30 and 3/32 luster	95-97½
3/36 luster	1.10-1.12½

KNITTING YARNS

Dyed and Bleached—Bradford System

2/7s straight 1/4 blood	96-1.02
2 and 3 ply 10s-20s straight 1/4 blood	98-1.04
2 and 3 ply 20s-24s straight 1/4 blood	99-1.05
2 and 3 ply 24s-28s straight 1/4 blood	1.06-1.07

(Reduce 8c. for yarn in oil)

FRENCH SPUN YARN

1/20 1/4 blood	85-87½
1/20 high 1/4	87½-90
1/20 3/8	90-92½
1/20 high 3/8	92½-95
1/20 1/2 blood	95-97½
1/30 1/2 blood	97½-1.00
1/40 1/2 blood	1.02½-1.05
1/50 delaine	1.07½-1.10
1/40 Australian	97½-1.00
1/50 Australian	1.15-1.20
1/60 Australian	1.20-1.25
1/70 Australian	1.25-1.30

For two ply knitting twist add 5c. additional to above prices.

For two ply weaving yarns add 7 1/2c. additional to above prices.

Knitting and Weaving

YARNS

Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment

EDWARD S. HYDE
226 CHESTNUT STREET
Philadelphia, Pa.

William Whitman Co.
COMMISSION MERCHANTS
COTTON and WORSTED YARNS
BOSTON NEW YORK PHILA. CHICAGO CHARLOTTE

JAMES LEES & SONS CO.
MINERVA MILLS
Spinners of WORSTED YARNS
For Weaving and Knitting
In the Grey and in all colors and mixtures
Philadelphia Office: 627-29 Bourse Bldg.
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J. B. Jamieson
77 Summer St., Boston
COTTON YARNS
of all descriptions
Correspondence Solicited

HAROLD R. SHIRLEY
242 Chestnut St., Philadelphia, Pa.
French Spun Worsted and Merino Yarns
Bradford Spun Yarns
Woolen Yarns
FOR WEAVING AND KNITTING

FREE, A CATALOG of all important textile books sent on request by Lord & Nagle Co., Boston, Mass.

SOAPS HIGH GRADE **SOAPS**
Bleaching, Fulling and Scouring
Red Oil and Olive Oil Crown Soaps
J. O. Draper Co. Est. 1860 Pawtucket, R. I.

FRENCH SPUN MERINO YARNS—FINE ONE-HALF BLOODS

Standard Grade

1/20 50/50 White Merino Cop	72
1/30 50/50 White Merino Cop	74
1/40 50/50 White Merino Cop	76
1/20 60/40 White Merino Cop	77½
1/30 60/40 White Merino Cop	79½
1/40 60/40 White Merino Cop	81½
1/20 70/30 White Merino Cop	83
1/30 70/30 White Merino Cop	85
1/40 70/30 White Merino Cop	87
1/20 80/20 White Merino Cop	89
1/30 80/20 White Merino Cop	91
1/40 80/20 White Merino Cop	93
Sliver and Sanitary Mixes	3c. more
Coning on 1/20	2c. more
Coning on 1/30	3c. more
Coning on 1/40	4c. more

WOOLEN AND MERINO YARNS

While spinners report very little call for woolen yarns at this time, still there is a decided improvement in the way of inquiries, especially for yarns for immediate delivery, principally for 2/20 and 2/23 cut yarns, which indicates that more or less business will be placed within the next few weeks as knitters are just beginning to get underway for next winter's goods. While prices today are very firm and we have made no change in our schedule over last month, there is every indication of an advance in all numbers when the consumer comes into the market for varns. The spinner gives as his reason for this increase the scarcity of raw stocks, and the anticipated demand for yarns which is expected to be heavy.

WOOLEN AND MERINO YARNS

2/20 Light Grey Mixed	80%	20%	65
2/20 Light Grey Mixed	90%	10%	67½-70
2/20 Light Grey All Wool			70-72½
2/20 Colored All Wool			72½-75
2/20 Bleached	80%	20%	75
2/20 Bleached	90%	10%	77½
2/20 Bleached All Wool			80-82½
2/23 Colored All Wool			75
2/23 Bleached 90/10			85
2/23 Bleached All Wool			87½-90
2/25 Light Gree Mixed All Wool			90
2/25 Bleached All Wool			97½-1.00

KNITTING MILL NEWS

New York, Herkimer. An addition, 90 by 20 feet, is to be built at the Gem department of the Union Mills. It was noted recently an addition is to be made at the Mechanicsville, N. Y., plant.

New York, Johnstown. It is reported that the Royal Knitting Company are building an addition to the plant, 90 by 20 feet. The mills have been running to capacity.

North Carolina. Hendersonville. It is reported that the Freeze-Bacon Hosiery Mills will build an addition.

THE RAG AND SHODDY MARKET

The export demand, although slowing up some during the past month constituted a majority of the woolen rag business, but the domestic business has been very quiet and some manufacturers have found it possible to secure small concessions. A good domestic buying demand would cause prices to stiffen up, especially if export orders increase also. Shoddy manufacturers still find business quiet as the woolen manufacturers have not yet been buying in large amounts. The outlook for the woolen manufacturing business is so much brighter that the shoddy manufacturers are optimistic for the future. Wool waste is quiet, but with a good demand for silk noils. The cotton waste market has been very dull. We quote prices as follows:

SHODDIES AND EXTRACTS

White knit	38-40
Red flannel	20-22
Red knit	23-25
Thibelts	18-20
Fine dark merino No. 1	16½-17½
Fine light merino	28-29
Fine black merino No. 2	15-16
Light delaines	25-26
Mixed delaine	12-13
No. 1 dark worsted	17-18
No. 2 dark worsted	16-17
Black worsted	19-20
Fine dark worsted clips	19-20
Blue serge, old	18-19
New blue clip	16-20
New black fine worsted clip	25-26
Light yarn, fine	28-30
Dark mixed, fine yarn	16-20
Dark blue hosiery clips, No. 1	17-20
Dark blue hosiery clips, No. 2	14-16

NEW WOOLEN RAGS

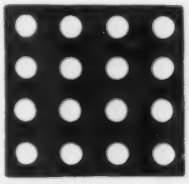
Fine merchant tailors	12-13
Choice light worsted	18-20
Fine gray worsted	20-22
Coarse gray clips	12-13
Fine dark worsted	14-16
Black worsted	22-23
Blue worsted	20-22
Brown worsted	17-18
Blue serge	19-20
Black serges	18-19
Light serges	20-22
Dark fancies	11-12
Dark serges	12-13
New blue flannel	15-16
New scarlet flannel	18-20

SOFTS AND KNIT STOCK

Soft woolen, best	9½
Red flannel	11¾
White softs	23-26
Merinos, fine light	18-19
Thibets	12½
Knit stock, red	13½
Light gray, underwear	9½-10
Coarse gray	14½-15
Blue knit	12-12½
Mixed hoods	9
White knit stock	27-28½

Pennsylvania, New Cumberland. The Elkwood Mills which have been closed for several months have been reopened under the management of D. O. Shuler, former superintendent of the plant. There were 9 knitting and 19 sewing machines operated on union suits, Swiss vests and babies' wrappers.

Woolen and Merino
YARNS
Eaton Rapids Woolen Mills
EATON RAPIDS, MICHIGAN



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Printing—Surface and warp printing.

WORKS:

Paterson, N. J. Dundee Lake, N. J. Allentown, Pa. Williamsport, Pa.

THE SILK MARKET

The silk market underwent several changes in prices in the past few weeks, one week showing an advance in prices and the next a sudden drop in same. This erratic condition has now disappeared and the market quotations, with but few exceptions, remain about the same as our last report, and the present market can be considered a firm one.

In Yokohama, the market continues active, with a good volume of business transacted, the most of which is from America. It is said in some quarters that nearly five thousand bales are now in stock, with plenty of new silk to be had. A maintenance of prices seems to be the issue, with no outlook for lower quotations. In Canton, owing to the flood which ruined the fourth crop, the market, while firm, is practically suspended at the present time. No contracts are made ahead and deliveries are made subject to a delay of at least four weeks. This situation will probably not adjust itself in some little time, as the loss of this crop caused a shortage which will be felt by the consumer. Reelers are offering a few lots in small quantities, but this does not change the situation to any extent.

The Italian market is reported active for the better grades and it is said that the reelers are maintaining prices and are selling much of their product, getting full value for same.

Shanghai is active on some grades, including steam filatures and tsatlees. There has been a little advance in prices on the former product.

It is reported that the mills in Lyons, France, are now running on full time, with business fairly active, although, owing to the conditions, the aggregate amount of business done has not reached a normal state.

The manufacturers in this country seem now quite hopeful for the fall and spring business, believing that there will be a good demand for their finished product. This is especially true in broad silks. The buying of the raw product, is, however, still on a conservative basis, but, as the manufacturers in general are in need of raw silk, it is thought that a steady activity in the market will ensue.

Ribbon manufacturers are still hoping that the fall and spring styles will demand their product, but at the present writing it is hard to say just what situation will develop.

There is no great demand by the cotton manufacturers for raw silk, but it is reported that the woolen manufacturers are somewhat active buy-

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Chicago Office, 206 So. Market St.
Boston Office, 78 Chauncy St.

ers in the market and this condition is likely to continue for some time to come. Hosiery manufacturers are not active buyers just at the present time, but it is thought that they will again be in the market as the season advances.

In the dry goods districts there appears to be a normal demand for the broad silks and the retailer is optimistic as to fall business. Dark colors still seem popular and soft finished goods like crepe de chene, charmuse, Georgette crepe are good sellers, in fact, the demand seems destined for satin back silks of all grades later on. Taffetas still remain popular and lighter shades are having the call of late, and velvets in both broad and narrow are sure to be in good demand and will be much worn the coming fall.

It seems a fact that all in the silk industry feel at the present time that, unless the unforseen happens, they will enjoy a fairly normal business the coming season. Below are prices current:

European

Grand Extra Classical Piedmont	3.80-3.85
Extra Classical Italian 12/14 12/16	3.60-3.65
Best Classical Italian 13/15 24/26	3.45-3.50
Classical Italian	3.40-3.45

60 days' basis

Japan

Filature Kansai Double Extra Cracks	3.55-3.60
Filature Kansai Extra 13/15	3.40-3.45
Filature Shinshu Extra 13/15	3.35-3.40
Filature Kansai Best No. 1	3.25-3.30
Filature Kansai No. 1 13/15	3.22½-3.25
Filature Shinshu No. 1 13/15	3.18½-3.20
Rereels No. 1 13/16	Nominal
Rereels No. 1 1/2 13/16	Nominal
Rereels No. 1 1/2-2	Nominal

6 months' basis

China

XXA Crack 14/16	2.85-2.90
Canton XXB Ordinary 14/16	2.57½-2.60
Canton XXB 22/26	2.45-2.50
Tsatlee Blue Dragon and Flying Horse	2.50-2.55
Tsatlee Kun Kee Mars No. 1	2.25-2.30
Tussah Filature Eight Cocoons 1-2	1.00

6 months' basis

SPUN SILK

The spun silk manufacturers report business very active, with orders coming in on almost a normal basis. Much spun silk is now being used by the woolen manufacturers and it is thought that manufacturers in other lines will buy much of this product later on. No change in prices which are quoted below:

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CORDONNETS AND NOILS
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SILK THROWING and WASTE SILK SPINNING Deals with the preparation of Yarn from the Raw Silk. 158 pages; 117 illustrations; cloth. $2.50 prepaid. LORD & NAGLE COMPANY, Boston, Mass

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Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.
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60/2	3.60
50/2	3.50
40/2	3.40
30/2	3.25
20/2	3.15
10/2	3.05

ARTIFICIAL SILK

Manufacturers of artificial silk are still optimistic as to the future and believe as the season advances that their product will be in much demand. The braid manufacturers are using at the present time quite a lot of this product and it is thought that they will increase the amount used in the near future. Prices remain the same as our last report and all quotations available are given below:

150 Deniers English A, Bleached	2.15-2.20
150 Deniers English B, Bleached	2.00-2.05
150 Deniers English C, Bleached	1.80-1.85

SILK MILL NEWS

New Jersey, Paterson. H. Pansy is starting a 10-loom broad silk plant in the Ashley & Bailey Mill, Warren St.

New Jersey, Paterson. The Triangle Silk Company is the name of an 8-loom plant equipped to make broad silks in the Ashley & Bailey Mill.

New Jersey, Paterson. A 20-loom broad silk plant will be started about August 15 in the Piaget Mill, Godwin St., by Joseph and Louis Gold.

New Jersey, Paterson. Abe. Pantel is starting a broad silk plant in the Ashley & Bailey Mill on Putnam St.

New Jersey, Paterson. The Lawrence Silk Mills have been incorporated with capital stock of $100,000 to manufacture silk and other textile fabrics in a plant at River and Bridge Sts. The incorporators are Joseph Wien and Mortimer Wien, Brooklyn, and Morris Stemberg and Dan Jerome of Paterson. The concern will start with 50 looms.

Massachusetts, Holvoke. Wm. Skinner & Sons, silk manufacturers, are securing options on land and buildings to the south of their Bond St. mill, with a view to making future additions. They are not ready to report on proposed enlargements.

New Jersey, Paterson. S. Hochman, 164 Martin St., has added 10 looms to his equipment. He now has 18 looms and reports sufficient orders to run double shift.

New Jersey, Paterson. The Imperial Silk Company is placing 24 more looms in their plant in the Aronsohn Mill, 10th Ave. and E. 18th St.

New Jersey, Paterson. M. Lefcowitz, located in the Albion Mill, with 34 broad silk looms, expects to break ground soon for a new mill building in the Totowa section of this city. An increase in equipment will very likely be made when the building is completed.

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SILK MILL NEWS

New Jersey, Paterson. The Cedar Cliff Silk Company will reopen the Paterson mill early in July or as soon as a new electric power plant is completed. Recent reports stated that the machinery was being moved to the annex at Binghamton, N. Y., owing to labor difficulties, but an official statement states that only part of the machinery has been removed and that the plant was closed only long enough to permit the changing over from steam to electric power. As noted in another part of this issue the reported enlargement of the Binghamton plant is simply being considered and it has not been definitely decided to make an enlargement at this time.

*New Jersey, Philipsburg. Good progress is being made on the construction of the addition to the plant of Reynolds & Tirrell on Warren Street, recently noted, and it is expected that manufacturing will be started in the new quarters Sept. 1. The new mill will be 90 by 130 feet. The total equipment of the plant will be 5,000 spindles and 50 looms for the manufacture of broad silks, operated by electric power. About 100 hands will be employed in the new mill. This concern has capital stock of $50,000. Philip Tirrell is president, agent and superintendent; John M. Reynolds, treasurer and buyer. The product is sold direct and through agents.

New Jersey, Plainfield. The Jersey Silk Mills are disposing of their old looms and putting in new ones instead. About 70 have been changed to date and very likely the balance of the plant will be changed.

New York, Amsterdam. Enlargements and improvements are being made at the local plant of Julius Kayser & Company, including the building of a fireproof tower to be used as an entrance and exit, and the erection of an extra story on one of two adjoining mills so as to make both of the same height. Both the tower and addition are of brick construction. The additional story will afford the plant extra floor space of 100 feet by 24 feet.

*Pennsylvania, Chambersburg. There will be a total of 224 looms in the plant of the Piedmont Silk Company when the machinery from the plant in Lackawanna, N. Y., recently purchased, is moved here.

*Pennsylvania, Kingston. A new 60 horse power boiler is to be installed by Crane Bros., Inc., when the work of rebuilding and enlarging the old machine shop and boiler house is completed.

*Pennsylvania, Reading. According to report, H. I. Felberbaum, proprietor of the Lion Silk Mills at 11th and Marion Sts., who recently purchased the property occupied by the concern, will increase the number of employes from 200 to nearly 400. The Reading plant will be the main factory after the increase. A plant is also operated at Allentown.

*Pennsylvania, South Bethlehem. Changes and improvements made by the Gallia Silk Mills comprise the replacing of 26 narrow looms with 36 wide looms.

MILL NEWS

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*Canada, Ontario, London. Construction work has been started on the new plant for the Middlesex Mills, Ltd. As noted in previous reports this concern was organized last March with capital stock of $80,000, and will manufacture a full line of twilling and towels, on 100 looms, and they will bleach and dye piece goods. It is expected to begin manufacturing about October 1. W. J. Teasdall, M. D., is president; J. W. Holliday, treasurer; and Albert Mitchell, agent, superintendent and buyer. The product will be sold direct.

Connecticut, New London. An addition is being built on the north side of the plant of the New England Carpet Lining Company which will about double the capacity. They manufacture carpet lining and stair pads.

*Connecticut, Niantic. Operations have been started by the Thames Dyeing & Bleaching Company in the new plant at Niantic, constructed to replace the burned plant at New London. The capitalization and officers are the same as in the old plant, Thomas G. Haney being president, manager and buyer, and John C. Geary, treasurer. Employment is given to 50 hands.

Georgia, Chickamauga. A 2-story addition is to be built to the bleachery building of the Crystal Springs Bleaching Company and another warehouse will be built.

Illinois, Chicago. A. C. Clark & Company, manufacturers of dental and surgical goods, are contemplating putting in a braiding department. H. R. Smith, 7111 Drexel Ave., Chicago, has the matter in charge and communications should be addressed to him.

Iowa, Waterloo. The Powers Mfg. Company are expecting to establish a bleaching plant for short lint cotton fiber and are interested in the matter of machinery for such a plant.

*Massachusetts, Canton. Improvements to be made by the Springdale Finishing Company consist of the reconstruction of one of the buildings of the present plant. This is one of the mills of John H. Meyer & Company, 50 Union Square, New York.

Massachusetts, Fall River. Contract for the construction of a 3-story addition, 250 by 100 feet, has been awarded by the Algonquin Printing Company. Edward I. Marvell is the architect and Puleston & McDougall are the contractors. The addition is to be an extension of the present main building and will be constructed of brick with gravel roof. Four new printing machines for wide goods will be installed in the new space, making a total of 16 printing machines in the plant.

Massachusetts, Webster. The Stevens Linen Works have resumed operations at full capacity and will now continue on a full time schedule as there are assurances that plenty of raw material will come forward. The mill has had plenty of orders, but the war cut off the supply of flax and tow from Russia and in the recent past the plant has been shut down for several weeks.

*Mississippi, Meridian. The new cotton bleaching plant, which it was reported last week was being organized by T. L. Wainwright, president and treasurer of the Stonewall (Miss.) Cotton Mills, and local interests, will be known as the Mississippi Fibre Company. The capital stock will be $35,000. It is expected that operations will be started in about three months.

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Everything in White Goods.
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MILL NEWS

*New York, Glens Falls. The enlargement being built at the plant of the Standard Textile Company is a small storage shed. The company manufactures cotton batts, mattress laps, and comfortables on present equipment of 8 garnetts and 2 pickers. The enlargement was made necessary by increased business. Winfield A. Huppuch is president; Walter W. Clark, treasurer and buyer; Frederick B. Richards, secretary, and George H. Blanchard, superintendent.

North Carolina, King's Mountain. The Pauline Mills, which now operate 48 looms on damask, are building a new carding and spinning department of 2,000 spindles to make yarns for the present weaving plant. Construction work has been started on the new addition.

*North Carolina, Valdese. A building of brick construction has been completed for the new Waldensian Swiss Embroidery Company and the machinery has been purchased and is being shipped from Germany. It is hoped it will be received soon. The importers who have charge of bringing over the machinery have stated that it is on the way over now. This company was organized as noted several weeks ago with capital stock of $125,000 to manufacture embroideries, laces and insertion. J. L. Garrou, of the local hosiery mill is interested. The organization has not been completed and the building of the mill and the securing of the machinery has been in the hands of a committee, of which Mr. Garrou is a member.

Pennsylvania, Hazleton. The contract for the erection of the new buildings to be erected for the Hazleton Bleachery, have been given out and work will be started at once, the architect designing the plant being W. E. S. Dyer, of Philadelphia, a specialist in textile buildings. The new plant, which will be two stories of brick and concrete, will be of slow burning construction and will be equipped with the latest improved machinery for bleaching hosiery, underwear and cotton fabrics, the concern at this time being very busy and a new and enlarged plant being required by them to take care of their increasing business.

Pennsylvania, Lansdale. The parties interested in the plant recently started here, reported as rubberizing and waterproofing fabrics, are the well known firm of William Ayres & Sons, manufacturers of blankets at 3rd and Cumberland Sts. They state that this plant, which is at present an experimental one and is operated in conjunction with their main mill, is for the purpose of manufacturing artificial leather, using as a base woven fabrics which are waterproofed and used for automobile tops and other purposes.

Pennsylvania, Philadelphia .The Cheltenham Tower Mills, Mascher and York Sts., in order to enlarge their equipment, have taken over more floor space in the same mill and installed 12 additional looms to be operated on jacquard fabrics. The plant, which is owned and operated by Patrick McPeak, manufactures a line of Turkish towels and terry fabrics.

FIRE, LIGHTNING, WINDSTORM.

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DYESTUFFS AND CHEMICALS

The unsettled conditions in the dyestuff and chemical trades caused by the European situation make it impossible to get quotations which would be of any value to our readers. The dyestuff and chemical list of quotations will therefore be omitted until this trade is again on a normal basis.

FIRES.

Massachusetts, Fall River. A fire at the plant of the Annawan Mills, Inc., foot of Grinnell St., caused some damage, the extent of which is not known at present.

New Jersey, Paterson. A fire in the Barnert Mill, Railroad Ave. and Grand St., caused some loss to Lessmann & Appett on the fourth floor of the building, the Williams Silk Company on the third floor, and the Barton Throwing Company on the second floor. The greater part of the damage was from water.

New York, Skaneateles Falls. Fire at the Glenside Woolen Mills caused loss estimated at $100,000. The heaviest loss was to machinery. The blaze is believed to have been caused by hot journal. The power plant suffered loss of about $2,500. Directly above the place where the fire gained headway the water tank of the plant was located. The tank was destroyed and the company's own fire protection rendered useless.

Pennsylvania, Conshohocken. A fire in the plant of the H. C. Jones Company, manufacturers of cottonades and cotton worsteds, destroyed the beaming room and stock of dyed cotton yarns, with loss of between $25,000 and $30,000, fully covered by insurance.

Pennsylvania, Philadelphia. A fire of unknown origin in the drying room of William Spink, Manayunk, manufacturers of shoddies and extracts, caused some damage.

South Carolina. Woodruff. Three hundred bales of cotton were damaged by a fire in the store house of the Woodruff Cotton Mills. The origin of the fire is unknown.

ENLARGEMENTS AND IMPROVEMENTS.

New Hampshire, Meredith. An addition 60 feet long is being built to the plant of the Meredith Linen Mills and more operatives will be employed. The present equipment is 2,000 spindles and 100 looms.

New Jersey, Camden. Confirming a report made by us during the month of January last Peech Sons & Phillips Company, mercerizers and converters of cotton yarns at West and Clinton Sts., have had prepared plans for an extensive addition to be erected adjoining their present buildings. The new addition will be three stories of brick, 42 by 42 feet, giving them an additional floor space of 6800 square feet. One of the floors will be used by them for skein mercerizing and the remaining floors for winding. Foster winders will be installed together with one of Smith, Drum & Co.'s latest improved skein mercerizing machines. A new power plant will also be installed to take charge of their enlarged equipment.

Barrett Specification Roofs

Union Station and Office Bldg. of Atlantic Coast Line R. R. Co. Wilmington, N. C.

Architect—J. F. Leitner Wilmington, N. C.
Chief Eng.—E. B. Pleasants
Gen'l Contrs.—Boyle-Robertson Const. Co., Washington, D. C.
Roofer—A. Y. Bond Greensboro, N. C.

MANY buildings have just "roofs". The contractor says "I'll build you a pitch and gravel roof"—and he does so.

It may be a *good* roof or it may be a *poor* one; yet a pitch and gravel roof is the best and most economical roof for any building—*provided it is built right.*

There is one sure way to eliminate all guess-work and chance—incorporate The Barrett Specification in full in your building plans and employ a responsible roofing contractor to do the work.

The result will be a roof which will give satisfactory service for 20 years and upwards, and that will show a unit cost (the cost per square foot per year of service) of about ¼ of a cent.

No other roof covering known can even approximate this figure.

Remember that a Barrett Specification Roof is not a ready-made roofing. It is constructed on the building and is recognized as *standard* by technical men generally.

A copy of The Barrett Specification with roofing diagrams mailed free on request.

Special Note — We advise incorporating in plans the full wording of The Barrett Specification, in order to avoid any misunderstanding. If any abbreviated form is desired, however, the following is suggested:

ROOFING—Shall be a Barrett Specification Roof laid as directed in printed Specification, revised August 15, 1911, using the materials specified and subject to the inspection requirement.

BARRETT MANUFACTURING COMPANY

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati
Pittsburgh Detroit Birmingham Kansas City Minneapolis Salt Lake City Seattle

THE PATERSON MFG. CO., Limited: Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S. Sydney, N. S.

MILL STOCKS

FALL RIVER MILLS

	Bid.	Asked.
American Linen	...	56
Arkwright Mfg. Co.	60	64
Barnaby	...	40
Barnard Mfg. Co.	...	40
Border City Mfg. Co.	...	106½
Bourne Mills	100	...
Chace Mills	100	102½
Charlton Mills	87½	...
Coanicut Mills	...	95
Cornell Mills t	146	...
Davis Mills	...	110
Davol Mills	90	...
Flint Mills	100	...
Granite Mills	75	...
Hargraves Mills	40	...
King Philip Mills	108	...
Laurel Lake Mfg. Co.	...	95
Lincoln Mfg. Co.	75	...
Luther Mfg. Co.	121	...
Merchants' Mfg. Co.	79	...
Mechanics Mills	75	80
Narragansett Mills	80	...
Osborn Mills	...	95
Parker Mills	42½	...
Pilgrim Mill, pfd.	...	95
Pocasset Mfg. Co.	...	87½
R. Borden Mfg. Co.	130	140
Sagamore Mfg. Co.	180	190
Seaconnet Mills	...	58
Shove Mills	70	...
Stafford Mills	67½	...
Stevens Mfg. Co.	128	...
Tecumseh Mills	105	...
Troy C. & W. Mfg. Co.	...	...
Union Cotton Mills	175	180
Wampanoag Mills	66	...
Weetamoe Mills	70	80

NEW BEDFORD MILLS

	Bid.	Asked.
Acushnet Mill	157½	...
Beacon Mfg. Co., com.,	102	...
Beacon Mfg. Co., pfd.,	112½	...
Booth Mfg. Co., com.	30	...
Booth Mfg. Co., pfd.	75	...
Bristol Mfg. Co.	...	77½
Butler Mill, com.,	...	75
Butler Mill, pfd.,	...	100
City Mfg. Co.	...	85
Dartmouth Mfg. Co., com.	160	...
Dartmouth Mfg. Co., pfd.	100	...
Gosnold Mills, pfd.	...	91
Grinnell Mfg. Co.	...	127½
Holmes Mfg. Co., com.	130	...
Holmes Mfg. Co., pfd.	...	115
Hathaway Mfg. Co.	150	...
Kilburn Mills	...	127½
Manomet Mills	...	121
Nashawena Mills	79	81
Neild Mfg. Co.	...	112½
N. B. Cotton Mills Corp., com.	100	...
N. B. Cotton Mills Corp., pfd.	...	98
Nonquitt Spinning Co.	87½	...
Page Mfg. Co.	75	...
Pierce Mfg. Co.	305	...
Pierce Bros.	100	...
Potomska Mills	124	...
Quisset Mills, com.	...	124
Quisset Mills, pfd.	111	113
Sharp Mills, com.	86	...
Sharp Mills, pfd.	...	106
Soule Mills	80	...
Taber Mills	...	100
Wamsutta Mills	120	...
Whitman Mills	128	...

SOUTHERN MILLS

	Bid.	Asked.
American Spinning Co.	155	...
American Spinning Co., pfd.,	100	...
Arkwright Mills	...	100
Avondale	120	126
Arlington	130	140
Brookside	...	...
Cannon	150	...
Carbarrus	115	...
Chadwick-Hoskins	...	...
Chadwick-Hoskins, pfd.,	...	100
Clara	100	...
Cliffside	175	...
Columbus Mfg Co.	94	100
Darlington	...	83½
Erwin, pfd.	...	101
Easley	...	175
Florence	125	130
Gibson, com.	...	105
Grendle	...	96
Glenwood	...	150
Glen Lowry, pfd.	...	76
Highland Park	151	200
Highland Park, pfd.	...	100
Hartsville	175	195
Hartsville, pfd.	...	100
Henrietta Mills	...	125
Kesler	150	160
Loray Mills, pfd.	...	86
Modena	...	96
Monarch, S. C.	115	...
Newberry	125	...
Norris Mills	...	121
Ninety-Six	130	140
Orr	...	86
Ozark	100	110
Pacolet Mfg. Co., pfd.	100	...
Patterson	140	...
Piedmont Mfg. Co.	150	167
Pell City, Ala.	...	80

MILL SECURITIES
Correspondence Invited
MORTON LACHENBRUCH & CO.
SPECIALISTS
34 Pine Street, New York City. Telephone John 3860

Poe, W. F., Manufacturing Co.	100	103
Salisbury	150	...
Roanoke Mills	...	155
Saxon	...	...
Spartan	100	110
Toxaway	...	131
Warren Mfg. Co., com.,	78	...
Warren Mfg. Co., pfd.,	...	107
Washington Mills	...	...
Washington Mills, pfd.,	...	100
Woodside Mills Co., com.,	...	88½
Woodside Mills Co., pfd.	...	80
Woodside Mills Co., guar.	...	101
Watts	...	85
Williamson	...	125
Ware Shoals	70	...
Whitney	110	120
Woodruff	...	107
Young Hartsell	90	...

OTHER NEW ENGLAND MILLS

	Par Value.	Last Sale.
Amoskeag Mfg. Co., com., N. H.	100	64¼
Amoskeag Mfg. Co., pfd., N. H.	100	99
Androscoggin Mills, Me.	100	155
Arlington Mills, Mass.	100	78½
Appleton Co., Mass.	100	172
Bates Carpet Co., Me.	100	241½
Berkshire Mfg. Co.	100	183⅛
Boston Belting Co.	100	*113
Bigelow-Hartford, pfd.	100	103⅛
Boston Duck Co., Mass.	100	1280
Boston Mfg. Co., Me.	100	105¼
Cabot Mfg. Co., Me.	100	100
Chicopee Mfg. Co., Mass.	100	90
Columbia Mfg. Co.	1000	1365
Continental Mills, Me.	100	75¼
Cordis Mills	100	140
Draper	100	227¼
Dwight Mills, Me.	100	*1035
Edwards Mfg. Co.	100	99
Essex Co., Mass.	100	195
Everett Mills, Mass.	100	115
Fisher Mfg. Co., Mass.	100	125¼
Franklin Co., Me.	100	201½
Great Falls Mfg. Co., N. H.	100	187¼
Hamilton Woolen Co., Mass.	100	80
Hamilton Mfg. Co., Mass.	100	77½
Harmony Mills	100	90
Hill Mfg. Co., Me.	100	90¼
Lancaster Mills, Mass.	100	76
Lawrence Mfg. Co., Mass.	100	150
Lockwood Co., Me.	100	100
Lowell Bleachery, Mass.	100	126⅓
Lowell Hosiery, Mass.	100	40
Lyman Mills, Mass.	100	118¼
Massachusetts Cotton Mills, Ga.	100	99
Massachusetts Cotton Mills, Mass.	100	*116
Merrimack Mfg. Co., Mass.	100	23¾

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Opaqueness. Weight. Thoroughly Penetrates the Warp. Strengthens Goods.

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Best Saddle for Top Rolls of Spinning Frames

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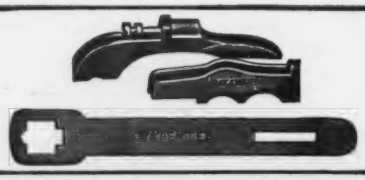
Manufacturers of all kinds of Saddles, Stirrups and Levers



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In our new location at Woodbury we have a modern factory with up-to-date machinery for making drop wires and can give your requirements prompt and careful attention.

Our drop wires are free from burr and have unequalled finish.

When desired we can keep your wires in stock ready to ship on receipt of order.

The wires will not rust in stock as we keep them in a special preparation.

Just let us know your needs and we will submit prices which we know will prove attractive.

CONNECTICUT MILL SUPPLY CO., WOODBURY, CONN.

Merrmack Mfg. Co., pfd.	100	83
Middlesex Co., Mass.	100	55
Middlesex Co., Mass., pfd.	100	75
Monadnock Mills, N. H.	100	1000
Nashua Mfg. Co., N. H.	500	711¼
Naumkeag Steam Cot. Co., Mass.	100	202
Newmarket Mfg. Co., N. H.	100	95¼
Otis Mfg. Co., Mass.	1000	2805
Pacific Mills, Mass.	100	121
Pepperell Mfg. Co., N. H.	100	345
Pepperell Mfg. Co. (new)	100	122
Plymouth Cordage Co., Mass.	100	210
Salmon Falls Mfg. Co., N. H.	300	23½
Shaw Stocking Co., Mass.	100	75
Suncook Mills, N. H.	100	20
Thorndyke Mfg. Co., Mass.	1000	1305
Tremont & Suffolk Mills, Mass.	100	100¼
Waltham Bleachery & Dye Works, Mass.	100	*100¼
York Mfg. Co., Me.	100	85

CANADIAN MILLS

	Bid.	Asked.
Can. Cottons	...	27
Can. Cottons, pfd.	71½	...
Dom. Textile	71	72½
Dom. Textile, pfd.	...	102
Mont. Cottons, com.	...	55
Mont. Cottons, pfd.	99	100

* Ex dividend.

Rhode Island, Pawtucket. Ground has been broken for a new addition to the Acme Finishing Company, which, when completed, will give an added floor area of 20,000 square feet. The addition will be 4 stories high, of brick, 160 by 27 feet, and will cost about $18,000. At the north end a further addition, measuring 60 by 27 feet, 1 story high, will be constructed. The added floor space will allow about a quarter increase in finished product. J. V. Dart is president; F. A. Decker, treasurer; A. F. Shaw, manager.

*Rhode Island, Pawtucket. The foundation for the large addition to the plant of the Seekonk Lace Company has been put in and work on the building will be started immediately. This enlargement will be of brick, 100 by 50 feet, and 2 stories high for the greater part, and will be equipped with 11 new lace machines with accessory machinery for making cotton and silk dress laces, giving a total of 25 lace machines in all. It is expected the building will be ready for occupancy by the first of November. The plant is being operated night and day.

South Carolina, Anderson. A new plant under the name of the Palmetto Mfg. Company will be started here soon. The new company has capital stock of $25,000 and plans to manufacture textile specialties such as waste products, Turkish towels, etc. They will occupy a building formerly operated by a knitting mill on West Whitner St. Bond Anderson is president; J. B. McDonald, vice-president; and E. P. Cofield, secretary and treasurer. It is planned to start operations some time in the fall.

Interruption of Production

is recognized by textile mill operators as the most costly element of repairs.

Allis-Chalmers TEXTILE MOTORS

are so liberally designed and so sturdily constructed that they will operate for years without need of repairs providing they are properly supplied with oil while in service.

"Motors for all drives"

Allis-Chalmers Manufacturing Company

Power and Electrical Equipments

Milwaukee - Wisconsin

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NON-FLUID OIL

Offers Manifold Economies

Economy in Lubricants. NON-FLUID OIL insures absolute freedom from waste, for it cannot drip or spatter like fluid oils, and it outlasts the best greases.

Economy in Full Production. Oil-stained "seconds" are impossible where there is no "thinning out" or spatter of lubricants.

Economy in Power. NON-FLUID OIL lubricates most efficiently without the friction drag of stiff greases, therefore it saves power.

Economy in Repairs. NON-FLUID OIL keeps the bearings cool in shafting, engine, spinning or any textile machinery, and minimizes wear in small parts like travelers or twister-rings.

Economy in Time. NON-FLUID OIL requires the least attention of any known lubricant.

Write for bulletin "Lubrication of Textile Machinery"

New York & New Jersey Lubricant Co.

165 Broadway, New York
1430 Michigan Ave., Chicago, Ill.

Established 1844

BENJ. BUCKLEY'S SON

(WM. J. BUCKLEY) *Gun Mill, Paterson, N. J.*

Manufacturer of all kinds of SPINDLES, FLYERS. RINGS, TUBES, CAPS, etc., for Cotton, Silk, Flax, Woolen and Worsted Machinery.

Roving Spindles and Flyers a Specialty. Light Forgings.

REPAIRING OF ALL KINDS

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Cleans Wool, Floors, Anything

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FOR PRINT WORKS GINGHAM AND COTTON MILLS, BLEACHERIES, ETC., ETC.

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BOSTON MASS. BRADFORD ENG.

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TEXTILE MACHINERY
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EGYPTIAN COTTON

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Special shaped carbon, black diamond, pointed tools for turning paper, rag, corn husk and cotton calender rolls, hard rubber, fibre, etc. Manufactured by

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FOR ALL TEXTILE FABRICS

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CRYSTAL SPECK DYE

Covers all vegetable and other specks. Does not stain white silk threads in goods.

Worden Chemical Works

4 Cedar Street, New York

Kaumagraph Transfer Stamps

in Gold and Colors for all fabrics

KAUMAGRAPH COMPANY

209-219 West 38th St., New York City

MILL NEWS.

New York, New York City. William Iselin & Company, 357 Fourth Ave., have reopened the down town branch of their underwear department in conjunction with their cotton goods department at 18 Thomas St.

*New York, Palatine Bridge. Sixty spindles, one winder and two knitting looms will be the initial equipment of the new silk fabric plant of Henry Underwood, who was recently reported as having leased a building. Mr. Underwood is starting the mill himself at present but will probably form a company later. He will manufacture fine knit fabric for gloves, skirts, underwear, etc.

New York, Oswego. A $40,000 order for export has been received by the Nottingham Knitting Company and the plant is being operated day and night. T. N. White, treasurer of the concern, is quoted stating they are filling orders which were formerly filled in Germany.

North Carolina, Weldon. A large export order for underwear has just been completed by the Weldon Cotton Mfg. Company and arrangements are being made for a second and larger export order. The plant has been running night and day for some time.

Pennsylvania, Meadville. The Meadville Knitting Mills are increasing their capital and offering for sale $15,000 of new stock. This concern was organized early in the year and took over the Conn Woolen Mills and installed a number of knitting machines.

Pennsylvania, Philadelphia. The Zephyr Knitting Mills, formerly located on Market St., above 4th, for the manufacture of sweater coats, which contemplated removal to larger quarters at 241 Arch St., have consolidated their plant with that of the United Knitting Company, 42 and 44 N. 6th St., to which location their equipment has been removed and is now in operation.

Pennsylvania, Philadelphia. The Park Sweater Mills, 2,223 S. 7th St. with a branch mill on York St., near Fairmount Park, are operating 9 knitters and 6 sewing machines on sweater coats, which they sell direct.

Pennsylvania, Pottsville. Report has it that Frank Kaiser of this town has in contemplation the starting up of a plant for the manufacture of women's underwear.

Pennsylvania, Quakertown. Report has it that Louis Fluck, receiver for the Quakertown Knitting Mills, operating 131 knitting machines on women's hosiery, in conjunction with the stockholders of the old company, will take over the plant and start it up again.

Tennessee, Crossville. J. B. Johnson is interested in a plan to establish a knitting mill.

*Wisconsin, Milwaukee. The men interested in the Luxite Textile, Inc., recently organized with capital stock of $25,000, to manufacture hosiery, knit goods and other textiles, are not ready to make any announcement. The incorporators are Edward Freschl, Fordyce H. Bottum and Louis Heilbronner.

FACTS AND GOSSIP.

Massachusetts, Gleasondale. The woolen manufacturing business formerly conducted by the late A. D. Gleason has been incorporated under the name of the Gleasondale Woolen Mills with capital stock of $100,000. Since the death of Mr. Gleason last December the business has been conducted under the style of the Estate of A. D Gleason under the management of C. E. Roberts, the superintendent. The temporary officers of the new company are Frank B. Tallman, 100 Franklin St., Boston, president; Charles E. Roberts, treasurer; Moses T. Stevens, North Andover, clerk. They manufacture woolen cloakings, suitings and dress goods on 9 sets of cards and 54 looms.

Massachusetts, Holden. The old Dawson Mill property here, operated up to a few months ago by the Darling Woolen Mill Company, has been sold at a foreclosure sale to the James F. Dorr estate, the original owners, who plan to sell the property. The mill was not included in the reorganization plans by which the mills at Hollis-ton and Worcester were taken over by new interests and started up. Reports of the organization of the new companies to take over these two mills and operate them, have been given in previous reports.

Massachusetts, Lowell. The Middlesex Company is said to be planning to erect a small mill at Warren and Hurd Sts. on a lot made vacant by the razing of old tenement property early in the year. Most of the property of the Middlesex Company is now rented to other manufacturing concerns and it is said that this projected new mill will be rented.

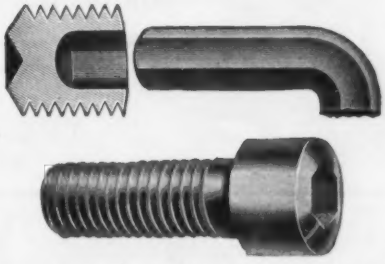
Massachusetts, Lowell. Some of the looms in the Boott Mills are running day and night on a large army contract for duck which is being filled for a foreign country.

Massachusetts, Methuen. The International Worsted Mills, manufacturers of fancy worsted goods on 26 broad looms, are working overtime filling orders. The mill has been running nights the past week and this schedule will probably be continued indefinitely.

Massachusetts, Needham Heights A lot of land adjoining the factory of the Saxony Knitting Mills has been purchased to provide for the future development of the business. They state that there are no plans for an immediate enlargement, however. This concern manufactures infants' and children's flat and ribbed underwear, also hosiery, sweaters, mittens and gloves, and has found business very satisfactory. The plant has been closed for the past week for the annual vacation for operatives and to facilitate the work of making necessary repairs and improvements. Manufacturing will be resumed next week at full production. They state that it may be necessary for them to operate the plant overtime in the near future.

Massachusetts, North Adams. In reference to the reports that are again current that the Hoosac Cotton Mills will make a $1,000,000 enlargement, W. K. Green, agent of the concern, states that the enlargement will not be made this year.

Allen Safety Set Screws
and Socket Cap Screws



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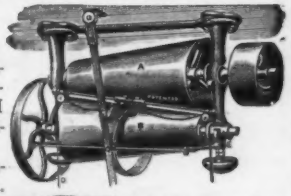
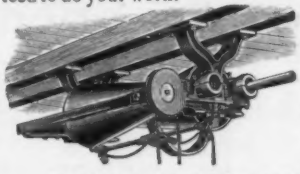
Variable Speed Countershafts
Evans Friction Cone Pulleys
will drive your machines at any desired speed from 1 to 6 by simply pulling a cord.
They are guaranteed to do your work.





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Over 10,000 Sets in operation in this Country and Europe.
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Put a Root Counter on the Job

And Prevent Waste, Errors and Disputes
Root Counters will register your output with uniform accuracy. They tell you just what a man or machine is costing. There's a "Root" for every use.

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All are guaranteed. Send for free trial offer.
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Capacities 10,000 to 10,000,000.
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Key Seating Attachment
FOR
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We offer an attachment for use with our Gear Cutting Machine, to cut key seats for the Woodruff System of Keying. Write for description, circulars and price.

THE D. E. WHITON MACHINE CO.,
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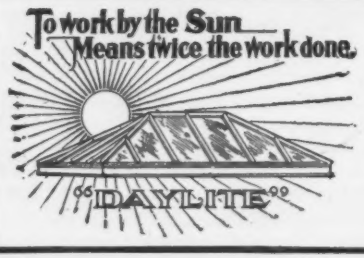

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ADMIT DAYLIGHT NOTHING ELSE
Applicable wherever daylight is desired.
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Installed in any type of boiler without change in setting. Uniform superheat guaranteed.

Power Specialty Company,
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Important Improvement in Worsted Spinning.
THE BAMFORD DUST PROOF and SELF-LUBRICATING SPINDLE TUBE
saves oil, prevents clogging with dust and lint, thereby insuring longer life to the tubes, saves labor, maintains uniform speed, **and most important of all, makes PERFECT YARN.** Refer to largest worsted mills.

BAMFORD & SMITH, Providence, R. I.
ALSO MFRS. OF
STEEL CAPS AND SPINDLES. **Caps, Flyers, Tubes, etc., Repaired.**

100 MILLS CAN TESTIFY
TO THE
Efficiency, Capacity and Excellent Finish
PRODUCED ON OUR
Finishing Machinery for Knitting Mills
Free Demonstration on Request
THE CONSOLIDATED HOSPITAL SUPPLY AND LAUNDRY MACHINERY CO., Saugatuck, Conn.

SAVE	THE CHAFFEE PATENT CLOTH BOARD,	Clean
Their Cost	Made of paper and wood, Needs no covers, Will not split or warp; Not liable to break.	LIGHT
In Freight	BOX SHOOKS and CLOTH BOARDS. MFG. BY CHAFFEE BROTHERS COMPANY, OXFORD, MASS.	Strong

FACTS AND GOSSIP.

California, Auburn. W. M. Dale of Sacramento has been here for the purpose of looking over possible sites for a small hosiery knitting plant.

Canada, British Columbia, Vancouver. The address of the Universal Knitting Company has been changed from 998 Thurlow St. to 624 Smythe St.

Connecticut, Chester. According to newspaper reports a plant is being established here to manufacture dyestuffs. The concern is simply called the dye works by Chester people and shipments come addressed to John T. Hettrick, who is said to be the fiscal agent for the concern and has an office at 165 Broadway, New York City. Changes are being made in the building occupied, among others being the installation of a ventilating system.

Connecticut, Danbury. The Imperial Silk Works have been incorporated with capital stock of $50,000 by George E. Von Gal, Emil Gantert and Charles R. Helan. The company manufactures hat bands and bindings.

Connecticut, Shelton. Beginning July 1 Sidney Blumenthal & Co., Inc., will put into effect a new schedule of working hours for the employes, paving the way for the establishment of a permanent night shift. A schedule of 52 hours a week has been adopted for the day shift, making the necessary corrections in the wages, enabling the operatives to earn the same as they have heretofore under the 55-hour schedule. The schedule for the evening shift will be 47 hours a week and the rates adjusted so that the workers will earn the same amount as at present earned in the day schedule of 55 hours work. These changes are voluntary and are in addition to an increase in wages ranging from 10 to 16 per cent. which was recently given weavers working on certain classes of goods.

*Georgia, Columbus. Fifty thousand dollars additional preferred stock is being issued by the Perkins Hosiery Mills and the proceeds will be used in completing a number of improvements, including an up-to-date bleaching department. As noted in previous reports the Massey Hosiery Mills were recently merged with the Perkins Hosiery Mills.

*Georgia, La Grange. At the quarterly meeting of the Elm City Cotton Mills, the Manchester Cotton Mills and the Unity Cotton Mill, the usual dividends of 3 per cent. were declared and it was stated that the progress being made on the construction of the new Hillside Cotton Mills is very gratifying.

*Georgia, Valdosta. Nothing definite has been done as yet in the matter of organizing a company to build the proposed new hosiery mill and details are unknown. It has been reported that A. J. Strickland of this place, R. B. Oliver and Knox Burger, president and treasurer respectively of the Marvville (Tenn.) Hosiery Mills, would build a knitting mill at Valdosta to manufacture hosiery. It was stated that a mill, 200 by 50 feet, would be built and equipped with about 100 knitting machines and dyeing and finishing equipment and that the company would be organized with capital stock of $50,000.

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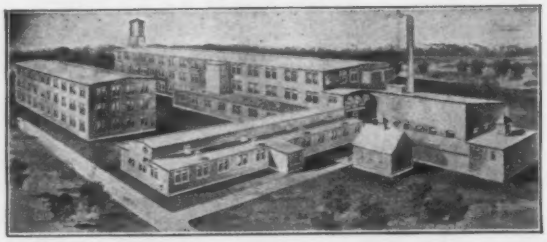

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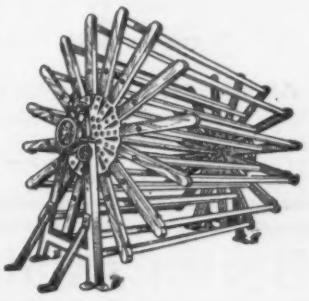

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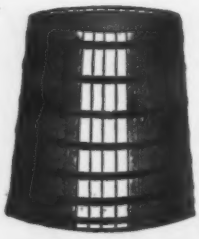

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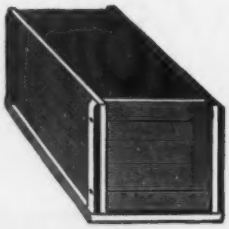

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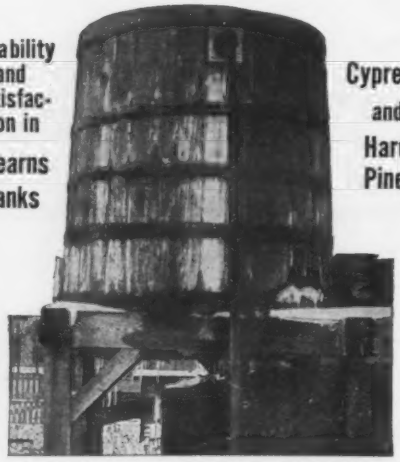

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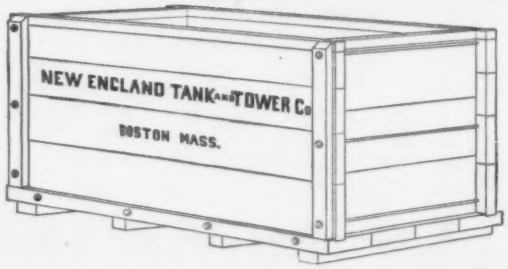

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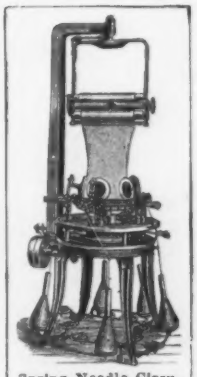

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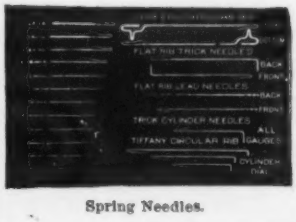

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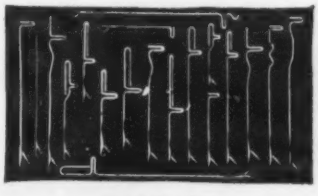

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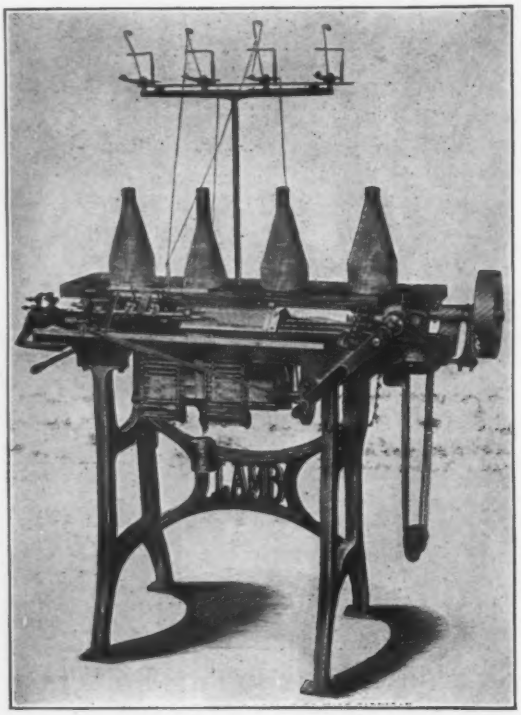

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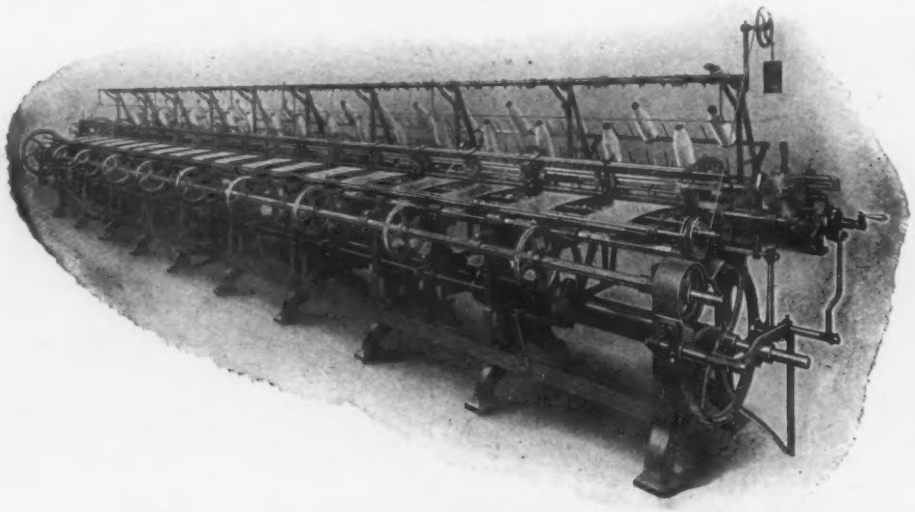

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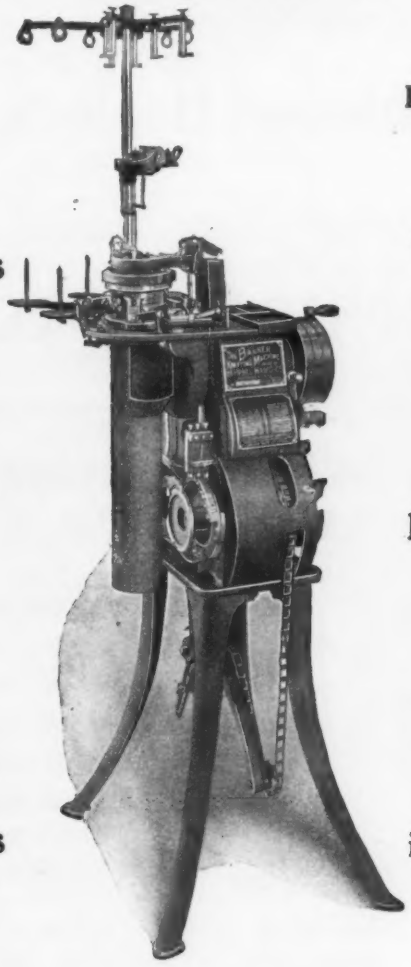

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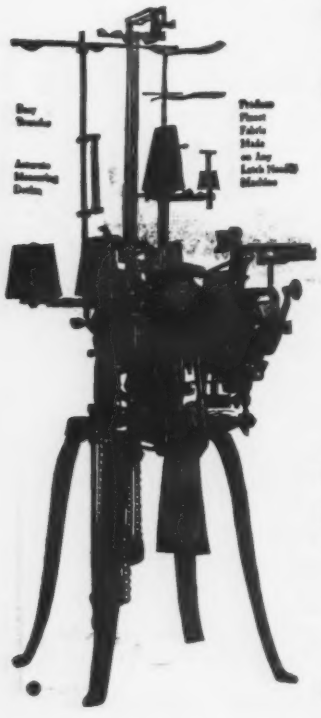

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Right Prices

THAT WORK ABSOLUTELY SMOOTH

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1825 E. Boston Ave.
PHILADELPHIA

FRIEDBERGER-AARON MFG. CO.

LEADING MANUFACTURERS

Braids and Edgings

For Trimming Ladies' Ribbed Underwear

OUR MOTTO:

Correct Goods, Right Prices, Prompt Deliveries

Mills: Wayne Junction, Philadelphia

POST OFFICE ADDRESS: LOGAN STATION, PHILADELPHIA

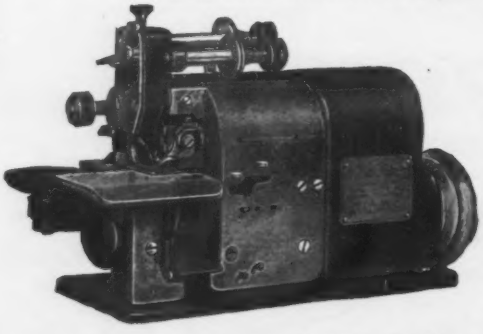
The Merrow

FAST

DURABLE

Light Running

High Speed Overseaming, Overedging and Shell Stitch Machines are



OUR CLASS 60 MACHINES for Trimming and Overseaming in one Operation produce the strongest, best Seams and do it with the greatest economy.

USE STYLE 18 for Horse Blankets.
STYLE 17 B or 22 for Bed Blankets.
STYLE 35 E SHELL, for Necks and Fronts of Rib Goods, produces the most showy, substantial finish.

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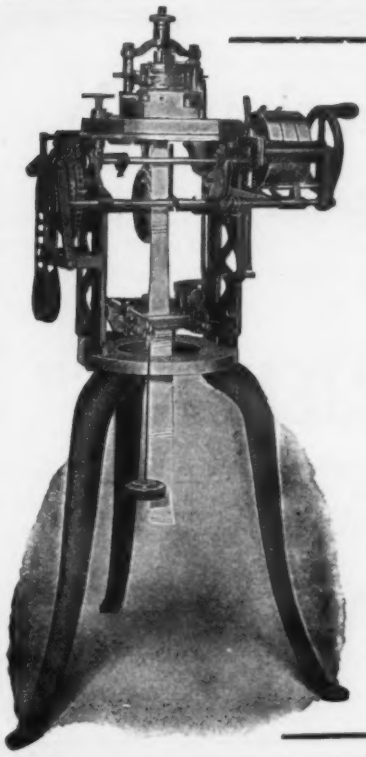

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213-217 Race Street, Philadelphia, Pa.

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of every kind for every purpose

HOSIERY RIBBERS

with Splicing, Striping, Two-speed, Selvage Welt and French Welt Attachments.

Full Automatic Hosiery Footers

BODY MACHINES, SLEEVERS, etc.

for Underwear, Sweaters, Toques, etc.

NECKTIE MACHINES

for making all kinds of tubular knitted scarfs.
Write for catalog, prices and samples.

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Sweater Coat Machines

Automatic Racking Machines with or without striping attachments.
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Full Automatic Circular

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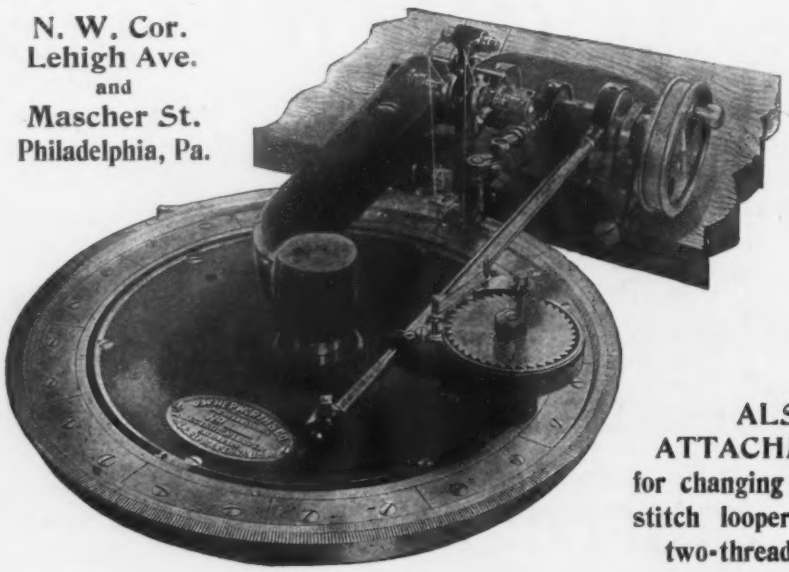


Makers
of
Two
Thread
Elastic
Lock
Stitch
Loopers

ALSO
ATTACHMENTS
for changing our single stitch loopers into the two-thread loopers

Notice to Hosiery Manufacturers:

It is to the interest of Users of Circular Knitting Machines to be advised that Certain Unlicensed Manufacturers of Knitting Machinery have very recently applied to their machines mechanism for automatically raising the thread carrier, leveling the needles and stopping the machine preparatory to transferring.

The trade is notified that this Improvement is thoroughly protected by the Houseman Patent No. 749,062, dated January 5, 1904, and that the only Manufacturers lawfully operating under the Patent are Standard Machine Company and Scott & Williams, Incorporated.

The Exclusive Rights of the patent owners have been Universally Respected for Eleven years and there has been no occasion heretofore to enforce such rights in the courts.

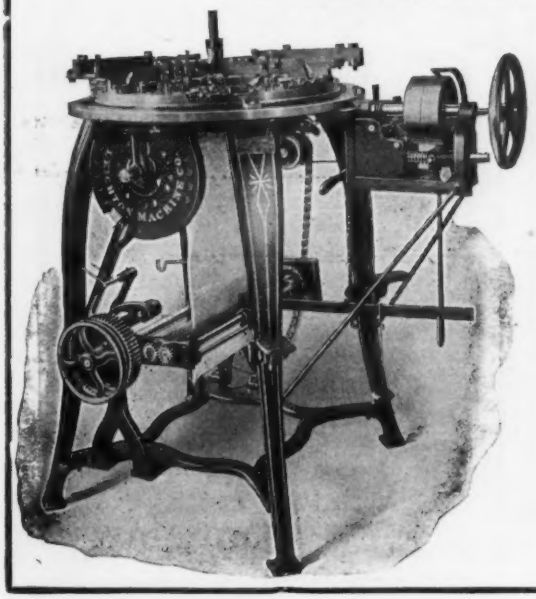
It is to the vital interest of the trade to be informed that both Manufacturers and Users of Infringing Machines are liable to Injunction, Profits and Damages; that neither the Manufacture nor Use of Infringing Machines can be permitted; and that we propose to enforce our rights, where necessary, by Appropriate Legal Action.

Standard Machine Company,

340 North Twelfth Street, Philadelphia, Penna.

THE LEIGHTON KNITTER

HAS EARNED THE REPUTATION OF PRODUCING



Firm, Elastic Garments

USING LOW GRADE STOCK

THESE MACHINES ARE BEING USED FOR

High Grade Goods

MORE AS COMPETITION INCREASES

Real Efficiency

Means Excellent Stitches with ECONOMICAL OPERATION

For Particulars ask

LEIGHTON MACHINE CO.

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Reg. U. S. Pat. Off.

Over 6,000,000

knitted garments, chiefly union suits have been

FLATLOCK SEAMED

and sold to the trade

You, too, can make a perfect union of

ABUTTED CUT EDGES

no thicker than the fabric itself

and produce a strong, soft and smooth FLAT SEAM if you use our new

FLATLOCK

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MACHINE

Domestic and Foreign Patents on Both Machine and Product

WILLCOX & GIBBS SEWING MACHINE CO.

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"Acme" and "Hemphill"

SEAMLESS HOSIERY

Knitting Machines

built by

Acme Knitting Machine & Needle Company

FRANKLIN, N. H.

Answer all purposes in the *most reliable*, *up-to-date*, and *economical* manner. Write us for full particulars.

Manufacturers Like our Latch Needles

because we make a superior grade of needles

Philadelphia Office, Bourse Bldg.

HOW MUCH OF THIS

$10,000,000.00

DO YOU WANT?

About $10,000,000.00 worth of full fashioned stockings are made in America each year.

No matter what proportion of these millions you are now getting, you can get more of it if you will make full fashioned hosiery on our machines.

Because, the stockings you make will fit perfectly and bring you repeat orders.

The leading hosiery manufacturers are installing these machines.

If you are thinking of making full fashioned goods take up the question with us—as our success depends upon yours, we will prove to you that we can help you before you spend a cent.

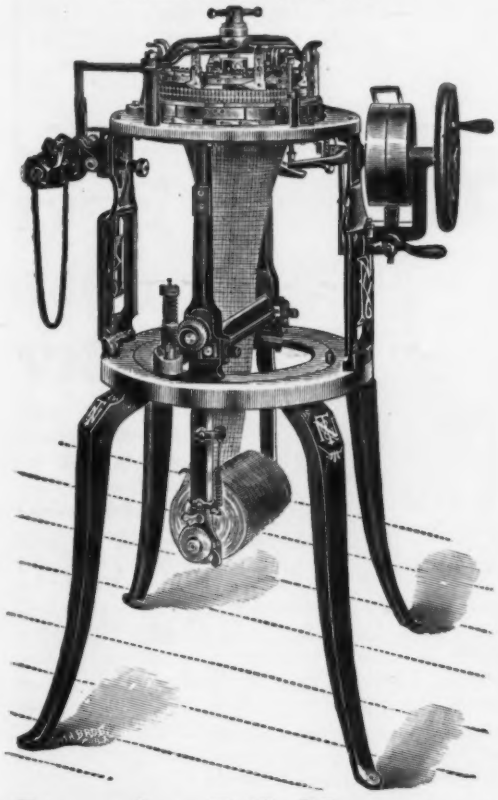
TEXTILE MACHINE WORKS

READING, PA.

THE MAKERS OF AMERICAN FULL FASHIONED HOSIERY MACHINES

NYE & TREDICK CO.

718-720 Cherry Street
PHILADELPHIA, PA.



Circular Rib Knitting MACHINERY

For making Ribbed Underwear, Combination Suits, Sweaters, Cuffs, Shirt Borders, Hosiery, etc. Correct Construction, Excellence and Durability.

LATEST IMPROVEMENTS

Quality of Fabrics and Production
UNEXCELLED

NYE & TREDICK CO.

1915

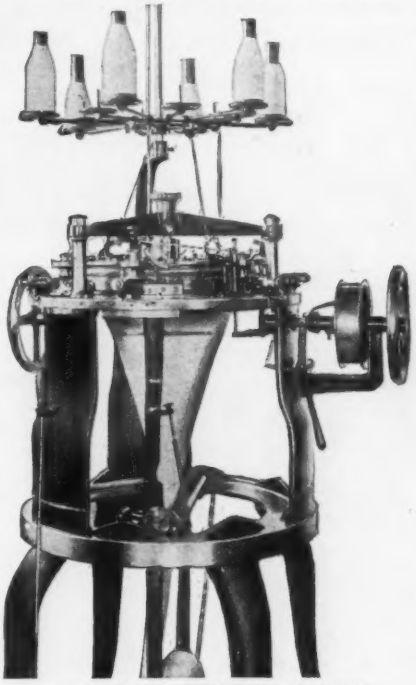
CRANE MFG. CO.

Established 1870 — LAKEPORT, N. H. — Incorporated 1890

Spring and Latch Needle Machines

for both Rib and Plain Work
Economically Producing

A GREAT VARIETY OF FABRICS



NEW SPRING NEEDLE RIB MACHINE

This machine has been improved in construction and equipped with new style feed, stop motion and take-up features.

All working parts easily accessible.

It is designed to make a high grade of ribbed underwear and will produce the finest fabric on the market.

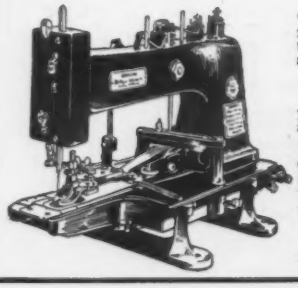
SOME CRANE FEATURES

Patent removable hardened Wing Burr Wheels.

Patent Thread Stop Motion can be fitted to 20 in. and 32 in. frames and are specially adapted for making fine Jersey Cloth and Stockinet.

Our flat machine is adapted for knitting collarettes.

Why Do You Put Buttons on Garments?



"So the garment can be buttoned when on," you would probably reply

Then why sew buttons on in such a way that it is almost impossible to button the garment neatly, especially when starched? Why have the buttons so tight that they will not stand the wear and tear of the laundry? Why sew them without any allowance for thread shrinkage? Why do these things when with the

Elastic Stitch Button Sewing Machine

you can sew buttons neatly and uniformly with only one thread (instead of two), with an allowance for thread shrinkage, and with a raised, hand-sewed effect?

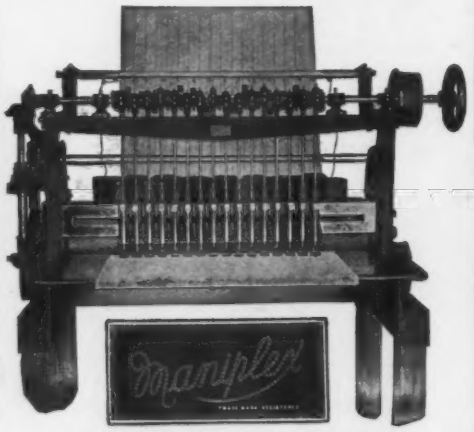
No Threads to trim. Saves 90 per cent of Needle Breakage. **No Bobbins to Wind.** **Will Sew all Buttons with any Thread.**

You can save money and increase the demand for your product by sewing your buttons on with the "Elastic Stitch" Button Sewing Machine. *Send for our "List of Users" booklet.*

Union Button Sewing Co., Dept., Frederick Osann Co.

394 Atlantic Ave., Boston, Mass. **Agents Everywhere** 245 Seventh Ave., New York

"Maniplex" Sewing Machines



For Multiple Stitching

Built for all purposes where a number of rows of stitching are required. ¶ With either form of stitch, single thread chain, double thread chain, or lock stitch, sewing material from 1-16 inch thick, up to 1 inch thick, and up to 120 inch wide. ¶ Furnished with any desired number of needles, spacing to suit requirements. ¶ We also build **Paper Slitting Machines** and design special machinery.

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Walpole, Mass., U. S. A.

The New Boss Seamless Knitter

Do you want the biggest production with the least menders, for the least money? If so, write to the Boss Knitting Machine Works for their circular with full directions. There is no cylinder to be handled. We use only one cylinder and transfer device for half hose or ladies' hose. This machine beats them all. Has no equal for simplicity and durability. Makes 300 revolutions per minute. Built in sizes from 2¼ to 5½; from 40 to 224 needles. Automatic in heel and toe. It is the strongest built knitter on earth.

Send for prices and particulars.

THE BOSS KNITTING MACHINE WORKS,

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NEW ENGLAND BUTT COMPANY

304 PEARL STREET, PROVIDENCE, R. I.

BRAIDING MACHINERY

ALL STYLES AND KINDS FOR FLAT AND ROUND BRAIDS

SOLID SASH AND CURTAIN CORDS

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AND ALL BRAIDED FABRICS

The Allen Winders.

Single Side Machines from 6 to 24 Spindles
Double Side Machines from 8 to 18 Spindles to a Side

FOR ART or NATURAL SILK, COTTON and MERCERIZED YARNS.

Built especially for

HOSIERY and UNDERWEAR

All Winders Equipped with Special Swifts for Silk, Art Silk and fine yarns.

Small Winders are very useful in Back Winding ends of Cones, or sample skeins, or legs of hosiery that are waste.—The machine illustrated is our No. 1 machine with a perfect fast and slow motion, winding a perfect bobbin that will all knit off.

Also Special Winders for Sweater Mfrs.

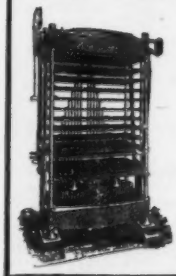
A. W. ALLEN 2421-3-5-7 N. Mascher St. Philadelphia, Pa.

The CRAWFORD

HOLLOW STEAM

PLATE PRESS

For Knit or Woolen Goods



The most reliable machine of the kind on the market.

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For all makes and sizes of

Circular Rib Knitting Machines

Twenty Years of Experience and Success

Adapted for **HEAVY SWEATER** yarns as well as **UNDERWEAR** work

Crawford Manufacturing Co.

NEW BRUNSWICK, N. J.

MACHINERY FOR

Making Cones

Cop Tubes and Straight Shells

For textile and manufacturing purposes

Knitting looms for millinery, dress and upholstery trimmings

JOHN EPPLER MACHINE WORKS
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The Best and Simplest

Machine on the Market for

Cutting Out Floating Threads

of Double Sole and High Spliced Heel Hosiery

Cuts and turns at one operation

There is no limit to capacity. Depends entirely on operator. A child can operate it. Send for further particulars to the builders.

Weinerth Ktg. & Machine Co., Inc.
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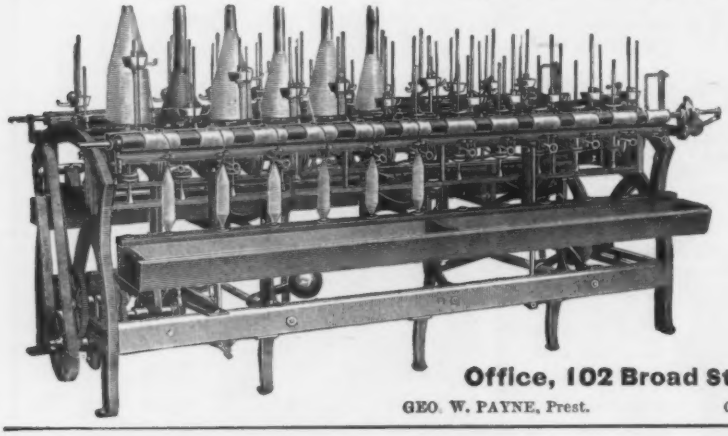
OVER 1,900 PAYNE WINDERS IN USE

By Hosiery Manufacturers, Wind for Cop, Skein or Bobbin



Improved

Upright Spoolers

To Spool from Cop, Skein or Bobbin

Doubling Spoolers for doubling 2, 3 or more ends into one

Upright Quillers, Quill from Cop, Skein or Bobbin.

Ring Dresser, Spooler and Reel Spindles, Cop Skewers, Warp, Spool, Spooler Guides. Bolsters and Stops Made and Repaired at Short Notice.

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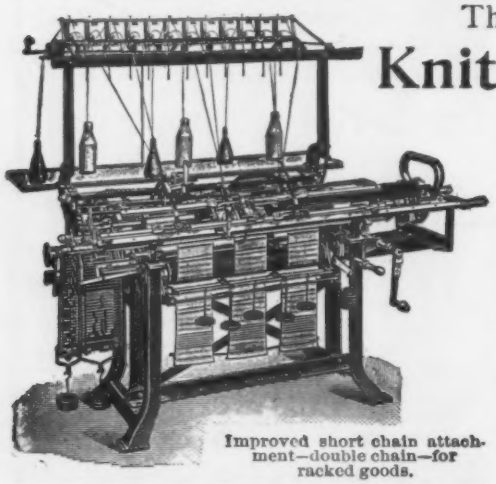

Improved short chain attachment—double chain—for racked goods.

That is the Brand of the

Knitting Machines

worldwide known to be **The Best**

160,000 Knitting Machines in use all over the Universe

CLAES & FLENTJE

Muhlhausen Thr., Germany

(Largest Knitting Machine Factory in the World)

The cut represents one of our full automatic machines with double chain, short chain attachment, doing away with the long chain and lots of blocks.

Machines for all kinds of plain and fancy knit goods by hand and full automatic by power.

Our knitting machines are far superior to any other in simplicity and construction. They give a higher production than any other on the market.

For full particulars, needles and supplies for all kinds of knitting machines, write to

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281 Ainslie Street **Brooklyn, N. Y.**

Eureka Fire Hose

Is a four ply CIRCULAR woven not FLAT woven hose like the ordinary kind, that possesses great strength and durability.

It will protect lives and property.

Made in all sizes. Can make prompt delivery.

EUREKA FIRE HOSE MFG. CO.

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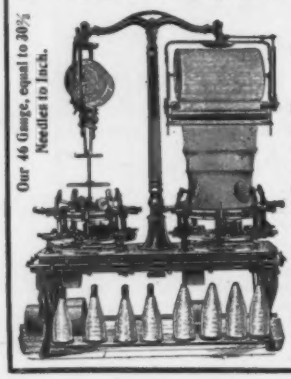
ROBT. W. GORMLY AND COMPANY, TROY, N. Y.

We are the Oldest Manufacturers

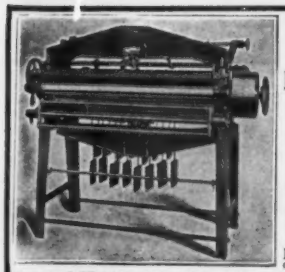
WITH

45 Years Practical Experience

in building Spring Need e Knitting Machines. Have succeeded in knitting the finest and coarsest work ever made on Spring Needle Knitting Machines in this country, any work from 3 to 46 gauge.



The above machine will also produce our new patent cloth made with a staggered needle.



50%

Better than ever from YOUR standpoint

Several New Features

have been added to the "1912" Cloth Cutting, Folding and Winding Machine which *add at least 50% to its value to YOU.* It will cut your cloth—fold the edges—roll it up and give you an exact measurement of every piece of cloth going through the machine. It saves time, labor, machines and cloth.

YOU ONLY NEED ONE MACHINE where before it required two, and you get an *extra* strip from every bolt of cloth.

It cuts the corners of expense in every way and leads to *more and greater profits.*

The Enormous Savings Will Interest You

Mail a card for complete information and prices. When in need of special machinery write me.

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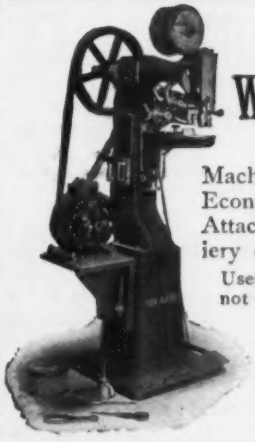

New Jersey Wire Stitcher

Highest Grade

Machine for rapid and Economical Method of Attaching Labels to Hosiery or other Garments.

Uses pointed staples, cannot tear the finest fabric.

Send for Catalogue

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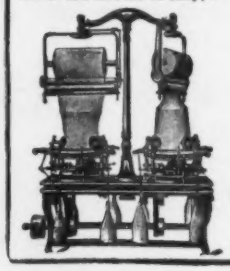
PHILADELPHIA

We Are the Oldest Manufacturers
IN THE WESTERN HEMISPHERE
Of Circular Spring Needle Loop-Wheel Knitting Machinery.

TOMPKINS BROS. CO., Troy, N.Y.

We submit the following extract from the sworn testimony of R. W. Gormly, in U. S. Circuit Court, Northern District of New York, in equity, No. 6764:

Cross Question 123. How long have you been a manufacturer of knitting machines? Answer I started in this business about the middle of May, 1900.



Tompkins Knitter

This design was adopted in 1875.

BUSINESS ESTABLISHED in 1846, before ROBERT W. GORMLEY Was born, according to his testimony in the case above cited.

STANDARD "G"

¶ A New Type of Hosiery Machine—being the result of 22 years of actual experience in studying the needs of the trade.

¶ Your investigation desired.

¶ Can be seen running at all times.

Standard Machine Company

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Philadelphia

No. 120

An OIL Made Absolutely Stainless

without sacrificing its lubricating base. Let our sample, ***its yours for the asking,*** show you the real definition of

"A Stainless Lubricant"

JONES & HARDY, Inc.
Hudson, N. Y.

1915 Edition Now Ready

American Directory of the Knitting Trade

33rd Year of Publication

"THE RED COVERED BOOK"

One hundred and fifty new mills and thousands of changes since 1914.
The edition is limited, and it is well to order now.

Handy Size for the Pocket PRICE $1.50 Nearly 700 Pages

What It Contains

Full report of every knitting mill in the United States and Canada, arranged alphabetically by states and towns, giving capitalization; names of the officers, including superintendent and buyer; kind of goods made; number of knitting machines, number of sewing machines; whether the mill dyes or bleaches or finishes; kind of power; number employed; selling agent; *kind and sizes of yarn bought.*

Special copyrighted maps of the mill districts showing the cities and towns where there are knitting mills. It is indexed so that any town may be quickly found.

Carefully classified index of manufacturers according to kind of goods made. All the manufacturers of the same kind of goods are grouped together.

Alphabetical index of manufacturers giving the page number where full report of mills may be found.

Knitting yarn manufacturers, giving classified lists of mills spinning yarns for the knitting trade.

List of dyers, bleachers, finishers, printers, etc., making a specialty of knit goods work.

Manufacturers' selling agents and commission merchants handling knit goods.

Export Firms in New York City handling hosiery, underwear and knit goods, showing the kind and class of goods handled and the countries to which they ship.

London (England) Agents and Importers of hosiery, underwear and knit goods.

British Jobbers and Wholesalers of hosiery, underwear and knit goods, including the names of concerns in important cities of the United Kingdom.

New York Buyers of knit goods for out of town jobbers and large retailers.

New York addresses of out of town jobbers, giving the New York address at which representatives of out of town jobbers can be reached.

List of Jobbers of knit goods in the U. S. telling the kind of goods handled and the name of the buyer: very complete.

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An index of machinery and supplies used in the manufacture of knit goods, also yarn dealers supplying knitting yarns.

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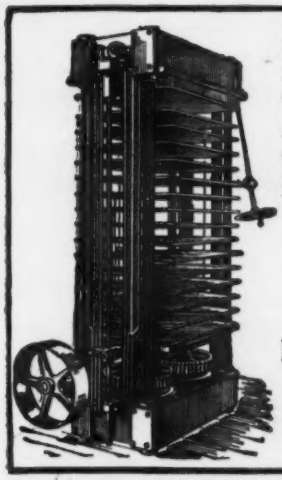
The demand of the selling end of the industry for a separate book giving only the particular lists it needs in its work is supplied by

The Knit Goods Trade

PRICE $1.00

A handy 300-page book giving Classified Index of Manufacturers, Jobbers, Department Stores, Large Retailers, New York Buyers, New York Addresses of Out of Town Jobbers, Manufacturers' Selling Agents, Export Firms in New York City, London (Eng.) Agents and Importers, British Jobbers and Wholesalers.

Published by the
LORD & NAGLE COMPANY
Textile Publishers, 144 Congress St., Boston
New York Philadelphia Chicago



Reliance Hot Plate Press

For Hosiery and Underwear Trade

For price and particulars address

Reliance Machine Works

Hedge and Plum Sts. Frankford, Phila., Pa.

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The Best Hosiery Needles in the market

Manufactured by

WARDWELL NEEDLE CO., LAKEPORT, N. H.

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Established 1874. Manufacturers of all kinds of

SPRING KNITTING NEEDLES

Slides, Sinkers, Jacks, Etc.

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Wool Year Book

In one volume are given outlines of woolen yarn manufacture, worsted yarn manufacture, on both English and French systems, weaving and finishing. There are numerous useful calculations, tables, recipes, and notes, 400 pages; green flexible leather.

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Full Fashioned Knitting MACHINES

and Stripers for all makes of machines

We are rigged up to do anything from a knocking over bit to a finished Cotton frame. Also repair and change machines from the coarsest to the finest gauge.

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Largest Manufacturers of Machine Needles in the World

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STANDARD LATCH NEEDLES

STANDARD TRADE MARK.

Longer Wear Better Work

Less Mending Fewer Seconds

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AND BURR BLADES OF ALL KINDS

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JOHN C. EGLY, Mgr. Manufacturers of

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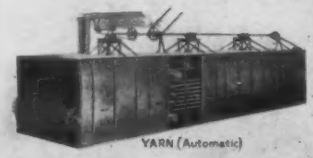
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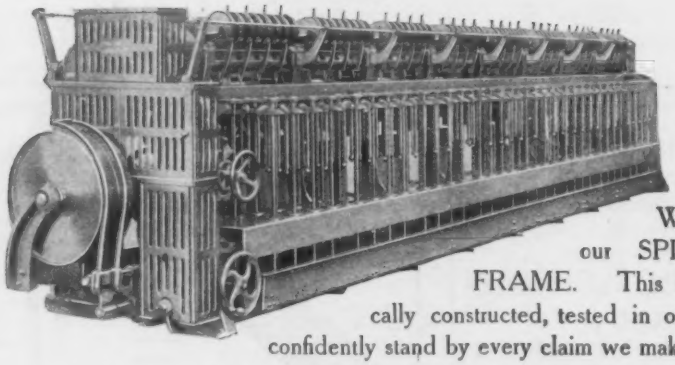

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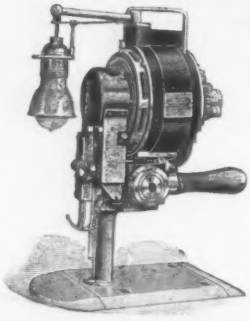
The EASTMAN CUTTER



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